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# Posters

## P1 GYNECOLOGICAL CYTOLOGY

### P1-1 | Does Knowledge of HPV Status at the Time of Pap Test Review Alter Cytologic Interpretation?

J. Novak; K. Mangiulli
*Columbia St. Mary's Hospital, Milwaukee, Wisconsin, USA*

**Objective:** Cervical cancer screening has traditionally been based on cervical cytology alone. With the introduction of Pap and HPV cotesting for women age 30 and older, the HPV status may be known at the time of Pap test review.

**Methods:** Reports from 3,849 consecutive abnormal automated liquid-based Pap tests were reviewed from a 3 year period prior to performing HPV testing in house without knowledge of the HPV status in patients age 30 and older. The ASCUS rate, ASCUS:SIL ratio, LSIL rate, ASC-H rate, HSIL rate, and ASC-H:HSIL ratio were calculated and compared to the results of 3,692 consecutive abnormal automated liquid-based Pap tests from a 3 year period following introduction of in house HPV testing in patients age 30 and older. All cases from both periods were reviewed by the same two board-certified cytopathologists, each with roughly 20 years' experience. Only Pap tests with known HPV status were used in calculations from the 3 year period following introduction of in house HPV testing.

**Results:** Although there was a slight increase in the ASCUS rate (3.73% to 4.68%), LSIL rate (2.05% to 2.26%), and ASC-H: HSIL ratio (0.32 to 0.43), the differences were not statistically significant ($p > 0.05$). There was a slight decrease in the ASC-H rate (0.2% to 0.17%) and the HSIL rate (0.51% to 0.36%) and again the differences were not statistically significant ($p > 0.05$). The ASCUS: SIL ratio was identical for both periods (1.37).

**Conclusion:** Although some studies have shown HPV status to significantly bias pathologists towards ASCUS but not other Bethesda categories[1] or cytotechnologists to ASCUS or worse[2], our study showed no statistically significant change in any category and the ASCUS: SIL ratio remained unchanged.

**References:**

1. Aisagbonhi and Chebib. Knowledge of high risk HPV status prior to final pathology sign-out biases cervical cytology interpretation. *Am J Clin Pathol*, 2016; Volume 5: S42–43.

2. Doxtader et al. Knowledge of the HPV status biases cytotechnologists' interpretation of Pap tests originally diagnosed as negative for intraepithelial lesion or malignancy. *Cancer Cytopathol* 2017; 125: 60–69.

### P1-2 | Micronuclei as a Biomarker for Cytogenetic Damage in Cervical Cytology of HIV Patients

R. Thambi; S. Sheeja; K. Subitha; P. Lekshmidevi
*Government medical college, Kottayam, Kerala, India*

**Abstract:** Micronucleus is a biomarker of cytotoxicity, formed during cell division when a chromosome or its fragment does not integrate in the daughter nucleus. Micronucleus in cervical intermediate squamous epithelium is seen in persistent HPV infections, cervical intraepithelial neoplasia and invasive cervical cancers. HIV infection can be associated with HPV infection and cervical malignancy. Micronuclei scoring on cervical epithelial cells can be used for screening patients for premalignant lesions.

**Objective:** The study was done to evaluate the role and effectiveness of micronuclei score in HIV patients.

**Methods:** Pap stained cervical smears of HIV patients reported according to the Bethesda system were screened for micronuclei. Only those patients who were negative for intraepithelial lesion or malignancy were included in the study. Micronuclei in the cytoplasm of the intermediate squamous cell were accessed by two pathologists in 500 cells under oil immersion of microscope. Criteria for identifying micronulei are: (1) The diameter of micronucleus between 1/16–1/3 of the diameter of main nuclei, (2) Round or oval in shape, (3) Non-refractive. (4) Not linked to but may overlap the nucleus (5) Same staining intensity and appears in the same plane as the nucleus focused. The frequency of micronuclei was obtained as the ratio between the number of micronuclei and the total number of cells analyzed. The micronuclei scores compared with the cervical smears from non-HIV patients.

**Results:** Significantly higher micronuclei scores were observed in HIV positive patients in comparison to HIV negative patients (p value <0.001). The number of micronuclei in HIV seropositive patients showed a mean $\pm$ SE of 59.26 $\pm$ 3.837 and for HIV negative patients it was 9.79 $\pm$ 0.477 which was statistically significant.

**Conclusion:** Micronuclei scoring is a simple, reliable, and reproducible test which an be done on routine Pap smears to pick up premalignant lesions in HIV patients.

  

## P1-3 | Recurrence of Acute Lymphoblastic Leukemia Presenting With a Uterine Cervical Mass Diagnosed By Papanicolaou Smears

M. Nifora[1]; E. Tsouma[1]; A. Papanastasiou[1]; K. Kosmas[2]; N. Koufopoulos[3]; E. Paliouri[1]; G. Galanopoulos[1]; A. Alexiadou[1]; S. Plyta[1]

*[1]Metaxa Cancer Hospital, Piraeus, Athens, Greece; [2]General Chest Diseases Hospital of Athens «Sotiria», Athens, Greece; [3]Cancer Hospital of Athens Saint Savvas*

**Objective:** Acute lymphoblastic leukemia is a hematologic malignancy that rarely involves the female genital tract and especially the uterine cervix. The presentation of a cervical mass infiltrated by lymphoblasts is rare as a recurrence of a known hematologic malignancy and extremely rare as a first manifestation of the disease. The hematologic malignancies that usually involve the uterine cervix are non-Hodgkin's lymphomas, diffuse large B-cell or Burkitt's lymphomas and granulocytic sarcomas.

**Methods:** We present a case of a 29-year old woman with a history of acute lyphoblasic leukemia who presented in our hospital with abnormal bleeding. A cervical mass was found by ultrasonographic examination and a Papanicolaou smear and biopsies were performed. The Pap smear consisted of squamous epithelial and lymphoid cells, the latter with atypical features; namely round-to-oval nuclei, scant cytoplasm, and high nuclear to cytoplasmic ratio. The nuclei of the atypical lymphoid cells had fine and dark chromatin and thickened nuclear membranes, with one or several nucleoli.

**Results:** The Pap smear indicated the presence of lymphoblastic cells and the probability of a recurrence of the known acute lymphoblastic leukemia of the patient in the uterine cervix. The histology report was compatible with disease relapse which presented as a cervical mass.

**Conclusions:** Recurrence of acute lymphoblastic leukemia presenting as a uterine cervical mass associated with abnormal bleeding is an unusual manifestation and the incidence of such a diagnosis on Papanicolaou smear is also low.

## P1-4 | Placental Site Nodule/Plaque: A Case Report

S. H. Lee[1]; H. S. Kim[2]

*[1]Department of Pathology, Seegene medical foundation, Seoul, Republic of Korea; [2]Department of Pathology, Severance Hospital, Yonsei University College of Medicine, Seoul, Korea*

**Background:** Liquid-based cytopathological features of placental site nodule/plaque have been seldom documented in the literature. We recently experienced an extremely rare case of endocervical placental site plaque, cytologically mimicking cervical low-grade squamous intrapeithelial lesion (LSIL).

**Case:** A 32-year-old woman was diagnosed as having cervical LSIL during cervicovaginal liquid-based preparation (LBP) for routine medical examination. She had previous history of polycystic ovarian syndrome and recent delivery (7 months ago). Based on the cytological diagnosis, cervical punch biopsy with endocervical curettage was performed. The biopsied specimen revealed typical histopathological features of placental site plaque. Immunohistochemically, the trophoblasts were positive for inhibin-alpha, p63, and CD10, but negative for p16. Human papillomavirus genotyping in both cytologic and biopsied specimens were negative. We reviewed LBP slides and considered that the LSIL-appearing atypical cells were trophoblasts rather than squamous cells. Our assumption was confirmed by inhibin-alpha immunocytochemistry, which displayed uniform cytoplasmic immunoreactivity in the trophoblasts.

**Conclusion:** We demonstrated that placental site plaque can mimic cervical LSIL, cytologically. Even though the possible presence of LSIL in other portions of cervix that were not sampled during punch biopsy, at least, the results of immunostaining and HPV genotyping do not support the possibility in given specimen.

## P1-5 | Role of Cervical Cytology in Detecting Glandular Lesions

H. Fernandes; S. Devaraju; A. Bhat; P. Ramachandran

*Fr Muller Medical College*

**Background:** Cervical cytology by Papanicolaou (Pap) smears is perhaps the most successful cancer-screening test developed to-date. It detects predominantly squamous intraepithelial and invasive lesions of the cervix. Sensitivity in detecting glandular lesions is low. We conducted this study to evaluate the diagnostic accuracy of cervical PAP smear for uterine glandular lesions.

**Materials and Methods:** Archived histopathology records of all cases reported as endocervical and endometrial adenocarcinoma in the study period were identified and the available corresponding PAP smears were retrieved. In addition PAP smears reported as Atypical Glandular Cells (AGC) during the same period were retrieved. The overall prevalence of AGC, sensitivity and specificity of PAP smears were calculated.

**Results:** Out of 20,443 histopathologicial specimens processed during the study period of two years, a total of 35 endometrial and endocervical adenocarcinomas were identified from the records. PAP smears predating histopathology diagnosis were available in 27 cases. The overall sensitivity of PAP smears in detecting glandular abnormality was 70%.

A total of 5,457 PAP smear records were identified during the study period. Out of these 36 smears were reported as atypical glandular cells using The Bethesda System of reporting 2001. Follow up histopathology samples were available in 24 patients. Prevalence of AGC in our study was 0.65%. The overall specificity of PAP smears, for diagnosis of AGC was 54%.

**Conclusion:** The prevalence AGC in PAP smears is low. The specificity of PAP smears, for diagnosis of GCA was found to be low. However sensitivity of PAP smears for detection GCA was moderate. The major hurdles to accurate cytodiagnosis are lesser representation of the glandular lesions on Pap smears and the well-known look-alikes of glandular lesions, which often lead to false positive diagnosis.

## P1-6 | Development of a Liquid Based Cytology Method for Laboratories With Limited Resources

R. Callaghan; R. Nelson; L. Allen; D. Purnell; A. Taylor; D. Morel; C. Whitehead

*BD Diagnostics, Durham, USA*

**Objectives:** Many regions of the world, with limited resources, are unable to take advantage of the clinical benefits of Liquid Based Cytology (LBC) due to instrumentation cost. To address this unmet need, we developed a manual LBC methodology that incorporated the cell enrichment advantages of SurePath™, using only a modified slide holder and common tabletop centrifuge. We report here slide quality data from this new SurePath Direct to Slide (DTS) method.

**Methods:** SurePath DTS slides were produced by utilizing modified slide holders that hold either one or three slides along with a standard Settling Chamber(s). 1 ml of density reagent was placed onto each slide/settling chamber. 2 ml of a standard cervical SurePath specimen was then slowly layered on top of the density reagent. The samples were then centrifuged for 2 min at 200 × g. After centrifugation the samples were decanted, washed with alcohol and manually stained following standard Papanicolaou methods. 96 residual individual SurePath cervical specimens were processed. The slides were then scored for the Slide Quality Characteristics of: Stain Quality, Cellular Preservation, Cellular Distribution, and Cellularity.

**Results:** All 96 specimens were successfully processed. 96/96 slides were scored as optimal or acceptable for Stain Quality and Cellular preservation (95% confidence interval (96%, 100%)). 95/96 slides were scored as optimal or acceptable for Cellular Distribution (95% confidence interval (94%, 100%)). 96/96 slides were scored as having >5,000 cells per slide (95% confidence interval (96%, 100%)).

**Conclusions:** The data establish that high quality LBC slides can be produced from this manual SurePath DTS method. The only equipment required are modified slide holders and a common tabletop centrifuge. This slide processing method retained the SurePath advantages of decreasing inflammatory and red blood cells while enriching the population of diagnostically relevant cells. Laboratories with limited resources may benefit from incorporating this manual LBC method.

## P1-7 | "Raspberry Bodies" And Positive Napsin A Immunoexpression Are Useful Features in Diagnosing Clear Cell Carcinoma of the Female Genital Tract in Cytology Samples: A Report Of 2 Rare Cases

B. Rekhi

*Department of Surgical Pathology, Division of Cytopathology, Tata Memorial Hospital, Parel, Mumbai, India*

**Objectives:** To describe useful cytomorphological features and immunohistochemical stains in diagnosis of 2 rare cases of clear cell carcinoma, presenting with ascites.

**Methods:** Smears in both cases were stained with May Grunwald Giemsa and Papanicolaou(Pap). Immunohistochemical staining was performed in cell block in the first and tissue section in the second case by immunoperoxidase method, using Ventana Benchmark XT autostainer, Roche, USA, with ultrakit Diaminobenzidine (DAB) kit detection system.

**Results:**

*Case 1.* A 49-year-old lady presented with abdominal distension accompanied with bloating sensation of 2 months duration. On clinical examination, a mobile irregular mass was felt in her right lower abdomen with gross ascites. Abdominal ultrasonogram revealed a left adnexal solid-cystic mass, measuring 11.7 cm, along with right echogenic adnexal mass measuring 4.6 cm. She had partial response to chemotherapy.

*Case 2.* A 71-year-old lady presented with pain abdomen and history of controlled hypertension, diabetes and hypothyroidism. She was also on treatment for pulmonary artery thrombosis. On clinical examination, there was pedal edema and free fluid felt during abdominal examination. Computed tomogram showed ascites along with thrombi in her right descending pulmonary artery and proximal inferior vena cava, with heterogeneous thickening in endometrium. Bilateral ovaries were not visualised.

Cytology smears prepared from ascitic fluid in both cases revealed clusters and papillae of malignant epithelial cells with dense eosinophilic cytoplasm, including few cells with clear cytoplasm and interspersed characteristic eosinophilic, hyaline 'raspberry-like' bodies, reminiscent of basement membrane material. By Immunohistochemistry, tumor cells in both cases were positive for Napsin A, CK7 and PAX8, while negative for ER, CK20, CDX2 and WT1.

**Conclusions:** Characteristic "raspberry bodies" are useful cytologic features for identification of clear cell carcinomas that rarely present with ascites. Positive expression of Napsin A and negative expression of WT1 constitute as useful immunohistochemical results in exact confirmation of these tumors.

## P1-8 | Quality Control of Gynecological Cytology

F. Alameda; I. Soler; E. Romero; A. Quiñonero; L. Pijuan; I. Vazaquez; B. LLoveras

*Department of Pathology, Cytology Unit, Hospital del Mar., Barcelona, Spain*

**Objectives:** Quality control of gynecological cytology has been recommended by Cervical Cancer Screening Guidelines. Our Department has participated in the Quality Control of Gynecological Cytology Programs, organized by the Spanish Society for Cytology (QCGCP-SSC). This program has used various strategies. Our aim is to describe the results obtained for our department.

**Materials and Methods:** In the first control, we exchanged a series of cytological samples with another hospital, so the quality control was a study of agreement in the diagnoses established. To this end, we sent 50 diagnosed cases to the other hospital, which reviewed these cases. The initial diagnoses were 10 negative, 10 LSIL, 10 HSIL and 20 ASCUS/ASCH cases. In the second control, a total of 23 cases were selected by three expert cytopathologists. Cytological samples from these cases were scanned and sent to various hospitals. The initial diagnoses in the second control were 5 ASCUS/ASCH, 6 HSIL, 11 LSIL and 1 negative cases. We calculated the agreement in negative, ASCHS+ and HSIL cases. Disagreement cases were stratified as SEVERE (ASCH/HSIL / negative), MAJOR (ASCUS/LSIL / negative), MINOR (Ascus / LSIL or ASCH / HSIL), and MEDIUM (all the other disagreements).

**Results:** 1) Agreement study. In the first control, the agreement was: NEGATIVE: 100%: ASCUS+ 95%; and HSIL 60%. In the second control, the agreement was: NEGATIVE: 100%; ASCUS* 100%; and HSIL: 100%. 2) Disagreement study. In the first control, the disagreement was: SEVERE: 6%; MAJOR: 22 (all ASCUS vs. negative); MINOR 18% (ASCUS vs. LSIL in most cases); and MEDIUM 8%. In the second control, the disagreement was found only in cases classified as MEDIUM: 13%.

**Comments and Discussion:** We have detected an improvement in the agreement of diagnoses of ASCUS+ and HSIL cases. The external quality controls serve to enhance agreement of the diagnosis.

## P1-9 | Colorectal Carcinoma in Vaginal Smear

M. D. Comes García; H. Mauricio Aviñó; M. Prieto Rodríguez; M. J. Artés Martínez; M. Bauza; V. Martínez i Cózar; L. Scavino Pinto; F. J. Vera Sempere

*Hospital Universitari i Politècnic La Fe. Valencia, Spain*

**Objectives:** To highlight the benefits of using immunohistochemistry techniques in Thinprep® system to diagnose tumors distinguishing between primary lesion and metastases.

**Methods:** The patient is a 43 year old female with a history of poorly differentiated colorectal carcinoma of intestinal type. A year after being diagnosed, she develops metastases on the right ovary, appendix and an implant in the cul de sac. A radical hysterectomy and appendicectomy is performed. Two years after the intervention, she redevelops metastases affecting the ureteral wall. Right hemicolectomy and ureterectomy is performed. In the post surgical PET CT, there's a highlight in the metabolic activity in the recto-sigmal segment and in the vaginal dome. A vaginal smear is performed.

**Results:** The smear shows groups of atypical epithelial cells. These groups are tridimensional, formed by cells with loss of nuclear-cytoplasmic proportions, prominent nucleoli and lumpy chromatin. In occasions, the cells are arranged forming peripheral fenced structures, with long nuclei, compatible with adenocarcinoma. Given the story of large bowel carcinoma, immunohistochemistry stains are performed. The neoplastic cells are inmunoreactive to CK20 and CDX2, compatible with intestinal adenocarcinoma.

**Conclusions:** Even though vaginal infiltration by colorectal carcinoma is infrequent, one should always consider it as a differential diagnosis. The opportunity to perform immunohistochemistry stains in Thinprep® system, and correlating its results with the patient's medical history, allows us most of the times, to perform and accurately diagnose neoplasms, distinguishing between primary lesion and metastases.

## P1-10 | Urgent Intraoperative Morphological Examination in Oncology Practice

N. N. Volchenko; O. V. Borisova; A. G. Ermolaeva; V. I. Mel'nikova; I. B. Baranova

*P. Hertsen Moscow Oncology Research Institute – branch of the National Medical Research Radiological Centre of the Ministry of Health of the Russian Federation*

The main tasks of urgent intraoperative morphological examination (UIME) are

1. Morphological verification of diagnosis after several unsuccessfull attempts or preoperative diagnostics impossibility, as well as the inconsistency of morphological diagnosis with operative findings.
2. Clarifying of cancer process extension by investigation of high-metastatic risk regions, surraunding organs, organ-specific targets, and also effusion and lavage fluid.
3. Examination of resection margins.
4. Control of sample adequacy in certain operations.

Urgent intraoperative morphological examination has limited capacity to clarify the tumor histogenesis and indicate the tumor differentiation grade. UIME has also limited application in deciding whether tumor is primary or secondary. UIME is not recommended in cases of skin tumors, soft-tissue sarcomas, osteosarcomas, lymphoma, polymorphic tumors. Investigation of pathomorphosis in tumor is also limited. UIME should not be used when cr in situ or microinvasion are expected.

The indications for UIME are determined by operating surgeon. The both methods (urgent cytology examination and urgent histology examination) have advantages and disadvantages.

**The aim of the study:** To assess the accuracy of UIME and analyse the reasons for the diagnostic errors.

**Materials and methods:** In 2016: 418 urgent histological examinations in 361 patients referred to our institution (7% of total number of operations) have been made, 1,198 urgent cytological examinations in 646 patients referred to our institution (12.5% of total number of operations) have been made.

In 2017: 417 urgent histological examinations in 356 patients referred to our institution (8% of total number of operations) have been made, 1,356 urgent cytological examinations in 676 patients referred to our institution (15.5% of total number of operations) have been made.

**Results:** The sensitivity of histological method in urgent intraoperative diagnostics was 98%, the specificity was 99%. The sensitivity of cytological method in urgent intraoperative diagnostics was 95%, the specificity was 96%. The overdiagnosis rate in urgent histology examination was 0.5%, underdiagnosis rate was 1%. The overdiagnosis rate in urgent cytotology examination was 3%, underdiagnosis rate was 9%. In urgent histology examination the medical reports with conjectural meaning was 2%. In urgent cytology – 11%. Morphological examination of resection margins noted the need for extension of surgical field in 12%. Non-informative material in urgent examination reached 2–5%, mainly in urgent cytology examination.

**Conclusion:** "Gold standard" of morphological examination is collaborative investigation, including cytology and histology examination, which are the complementary methods. It must be stressed that interdisciplinary approach to diagnostics (i.a. intraoperative diagnostics), taking in account clinical examination, instrumental diagnostic methods, is required to achieve an accurate diagnosis.

## P1-11 | The Importance of Pap Smear as Cytological Screening Methods

L. Bogdanovska; N. Velickova
*Faculty of medical science, University Goce Delcev – Stip, R.Macedonia*

**Objectives:** The Papanicolaou cervical cytology test is capable of detecting cervical cancer at an early stage and is used widely in developed countries, where it has decreased both the incidence and mortality of cervical cancer. It is recommended for all women of reproductive age. Pap testing seems not to have a clear impact on the risk of cervical cancer at young age, especially considering women aged under 25. This study was undertaken to evaluate the prevalence of cervical precancerous and cancer pick up by single pap smear test. A prospective study of pap smear test of three years duration 2015–2017 in Obstetrics and Gynecology department in Macedonia. The patients are in the age group of active reproductive period (21–40 years).

**Methods:** Pap test is a procedure that takes a few minutes and involves taking cells from the opening of the cervix in order to verify if they are normal. It involves exfoliating cells from the transformation zone of the cervix to enable examination of these cells microscopically for detection of cancerous or precancerous lesions.

**Results:** This study shows that routine pap smear screening in patients attending gynecological OPD is the good method of detecting precancerous cervical intraepithelial neoplasia (CIN) lesion and early cervical cancer.

**Conclusions:** Absence of screening in this age group may miss these high-grade cervical lesions that could progress to cervical cancer in the near future.

## P1-12 | The Accuracy of P16/Ki-67 Dual Stain in Pap Smears in Women Under 30 Years With Low Grade Cytology Results

D. Podgoršek; N. Irgel; B. Antolovič; L. Salobir; S. Šramek-Zatler; A. Repše-Fokter
*General Hospital Celje, Celje, Slovenia*

**Objectives:** Testing for the presence of the human papillomavirus (HPV) is widely accepted for triaging atypical Papanicolaou cytology results. However, HPV testing has limited use in triaging atypical cytological findings in young population due to high prevalence rates. In the current prospective study, the authors assessed the diagnostic performance of p16/Ki-67 dual-stained cytology in women under 30 years who had been according to the guidelines referred to colposcopy after the second atypical cytology result.

**Methods:** A total of 42 ASC-US, ASC-H, LSIL and LSIL/HSIL cases were tested with p16/Ki-67 dual-stained cytology. Colposcopy-guided biopsy results of cervical intraepithelial neoplasia of grade 2 or worse (CIN2+) were used as clinical endpoints.

**Results:** Among 42 tested samples 19 were p16/Ki-67 positive while 23 were negative. Histology was performed in 20/42 patients (14 p16/Ki-67 positive, 6 P16/Ki-67 negative). CIN2+ was diagnosed in 12/14 p16/Ki-67 positive cases with available histological data. The rate of histology confirmed HSIL – p16/Ki-67 positive samples was 85.7%. 14/42 patients were diagnosed as ASC – US or LSIL. All ASC-US patients (3/14) were p16/Ki-67 negative, while there were few (4/14) LSIL p16/Ki-67 positive patients; two of them with CIN 1. Other LSIL patients were p16/Ki-67 negative, two of them with negative histology or follow-up. LSIL patients who did not undergo histological examination are followed by repeat cytology and colposcopy.

**Conclusions:** Our study confirmed the clinical usefulness of triaging young women with ASC-US or LSIL Papanicolaou cytology results by p16/Ki-67 dual-stained cytology. p16/Ki-67 dual stain can provide additional valuable information that may lead to higher quality management of young women and may help to reduce the number of unnecessary colposcopy referrals.

## P1-13 | Clinical Significance of Atypical Glandural Cells In Cervical Smears

N. Irgel; A. Repše-Fokter
*Celje General Hospital, Celje, Slovenia*

**Objectives:** Interpretation of atypical glandular cells (AGC) on Pap test is one of the most difficult fields in gynecological cytopatology. AGC Pap smears are often associated with more severe underlying abnormalities. Because of this, simply repeating the Pap smear is not sufficient for managing patients who have potentially more serious AGC readings.

**Methods:** In the present study we evaluated 517 496 cervikal smears, which were obtained in Department of Pathology and Cytology, Celje General Hospital, Celje, Slovenia between January 1, 2003 and December 31, 2016 with emphasis on AGC of all types. We compared cytologic diagnosis of AGC with histologic results and determined the precentage of clinically significant lesions (CIN 2+, AIS, adenocarcinoma and endometrial adenocarcinoma), and clinically less significant lesions (CIN 1 or less).

**Results:** AGC were found in 968 cases (0.2%). Histological results were available for 369 of 848 (44%) patients with atypical glandular cells not otherwise specified (AGC-NOS) and for 110 of 120 (92%) patients with AGC-favor neoplastic/AIS/AC (AGC-FN). Clinically significant lesions were histologically confirmed in 162 out of 369 patients with AGC –NOS (44%) and in 90 out of 110 patients with cytologic diagnosis of AGC-FN or worse (82%).

**Conclusions:** The interpretation of glandular channges in Pap smears is difficult and challenging. Although AGC are a rare finding they are often associated with significant disease and the patients should be followed as recomended in national and international guidelines.

## P1-14 | Cytohistologic Correlation of Atypical Glandular Cell (AGC) on Pap Smears. Our Experience

C. Psachoulia; Z. Stamou; K. Kekebanou; E. Chrisochoidou; V. Dagla; M. Kardari
*University Hospital of Patras, Patras, Greece*

**Objectives:** The cytological diagnosis of atypical glandular cells (AGC) in Papanicolaou smears is relatively uncommon and comprises less than 1% of the other cervical cytologic abnormalities.
In this study, the cytologic correlation of atypical glandular cells (AGC) detected during routine cervical screening with the histopathologic results, as well as, the investigation of the risk of malignancy is presented.

**Methods:** Twenty-four cases with cytologic AGC diagnosis in Papanicolaou liquid based specimens (ThinPrep) identified according the Bethesda 2001 classification system between January 2001 and December 2017, who underwent colposcopic and histopathologic evaluation, were retrospectively reviewed.

**Results:** Twenty-four AGC cytologic diagnoses with subsequent biopsies were found. 87.5% (21/24) of the cases studied were subclassified as AGC-NOS and 12.5% (3/24) of the cases were detected to the AGC favor neoplasia category. The histopathologic results in the AGC-NOS subclassification were as follows: 28.5% (6/21) cervical high grade intraepithelial lesions,4.76% (1/21) endometrial polyp,42.85% (9/21)benign endocervical lesions,23.8% (5/21) no lesions. In the AGC favor neoplasia category, the rate of malignancy was 66.6% (2/3)regarding two cases of endometrial adenocarcinoma and a case of high grade cervical intraepithelial neoplasia (33.3%).

**Conclusions:** AGC found at cervical screening is associated with an overall incidence of pre-invasive and invasive lesions up to 37.5% with greater prevalence (66.6%) of glandular malignancy exclusively in the AGC favor neoplasia subclassification.

## P1-15 | Consistency Between Histopathology and Smear Cytology of Ovarial Clear Cell Carcinoma (OCCC)

S. Asano; S. Ono; K. Yamazaki; A. Watanabe; K. Komatsu; T. Matsumoto; H. Kondo; K. Mori; H. Nishiyama; T. Honda
*Iwaki Kyoritsu General Hospital*

**Objectives:** Ovarian clear cell carcinoma (OCCC) is an aggressive malignant tumor of the ovary, which shows worse prognosis versus other surface epithelial tumors and poor response to chemotherapy. In addition, OCCC takes a variety of features, it is often difficult to diagnose in the frozen tissue section. And so, we have already reported the usefulness of the touch smear cytology during the operation. In this report, we will report the immunostaining pattern in histology and touch smear cytology using the same cases.

**Methods:** Aimed at thirteen cases (from January 2008 to July 2015. From 41 years to 73 years old, 5 cases on the left side, 8 cases on the right side), which were diagnosed as OCCC, were targeted. Staining attitude in 13 cases of tissues and cytology was examined using HNF-1β, BRCA-1, Napsin A, CK7, CK20, collagen IV and IL-6 antibodies.

**Results:** Both HNF-1β and BRCA-1 are positive in nuclear in both tissues and touch smear, Napsin A in the tissue, especially on the small papillary surface cell membranes and vacuoles, touch smear showed a granular positive image in the cell. Both tissues and touch smear were CK7+ /CK20-. Collagen IV showed a positive along the interstitium, and IL-6 exhibited a positive in the interstitium, a part of the cell and the glandular cavity in the tissue, but there was no specificity in the touch smear cytology

**Conclusions:** Differences of immunostaining patterns between tissue and touch smear cytology in OCCC may be due to differences in planar and stereo cytological specimens, or fixed differences.

## P1-16 | Cytological Diagnosis of Cervical Adenocarcinoma and Histological Correlation In Cytology Laboratory Eurofins-Megalab Madrid

J. Redondo Lopez[1]; R. Marcos Vicente[1]; J. R. Ramirez Garcia[2]

*[1]Pathology and cytology technician, Eurofins Megalab, Madrid; [2]Head of the Pathology Unit Eurofins-Megalab, Spain*

**Introduction:** Cervical adenocarcinoma has increased in last years, and there is no early form of detection other than cervicovaginal cytology, which has a high sensitivity and specificity for squamous lesions, but poor sensitivity in detecting adenocarcinoma.

**Objective:** To know the number of cases of cervical adenocarcinoma diagnosed by cervicovaginal cytology, the diagnosis clues and the degree of discordance by histopathological study.

**Material and Methods:** A cytohistological correlation was performed in 17 of 21 cases diagnosed as "adenocarcinoma" in cervical cytology in Megalab in the period from 2010 to 2017.

**Results:** 17 cases with biopsy study were categorised into 8 cases (38.09%) of adenocarcinoma of the cervix, 5 (23.8%) of adenocarcinoma of the endometrium, 3 (14.28%) squamous lesions, 1 (4.76%) changes by metaplasia or cervicitis. Four cases (19.04%) did not have an adequate biopsy at the first time, and the diagnosis could not be corroborated.

**Conclusions:** Cervicovaginal cytology is a useful tool for the detection of glandular lesions, however, it is difficult to discriminate on origin only through morphology, since many other entities overlap.

## P1-17 | LBC vs. Conventional Smears: Results and Considerations About the Value of an Inexpensive Method, Useful In Small Laboratories

S. Teleman[1,2]; E. Cojocaru[1,3]; C. Ungureanu[1,2]; A. C. Anton[1,4]; M. Grigore[1,4]

*[1]University of Medicine and Pharmacy "Gr. T. Popa", Iasi, Romania; [2]"Sf. Spiridon" Emergency Clinical Hospital, Iasi, Romania; [3]"St. Mary" Emergency Hospital for Children, Iasi, Romania; [4]"Cuza Voda" Obstetrics-Gynecology Clinic Hospital, Iasi, Romania*

**Introduction:** Modern laboratories widely use liquid-based cytology (LBC), although the costs involved in this technique are higher than conventional cytology (CS).

**Objectives:** This study is a follow-up of a prospective analysis with partial results presented in 2014, in order to compare the utility of LBC vs. CS and the implementation of a simple and inexpensive technique.

**Methods:** After eliminating unsatisfactory smears, the number of cases was extended to 300 LBC processed by CLEARPREP – RESOLUTION BIOMED-USA method, doubled for comparative analysis with conventional smears. As in the previous study, the samples were processed in our laboratory using a simple centrifuge and cells dispersion on slides was performed using a special solution delivered by the manufacturer. After Papanicolaou stain, the results interpretation was done according to Bethesda 2001 system.

**Results:** Cytological diagnosis by Clear Prep revealed WNL / INFL / REACTIVE in 270 cases, ASCUS in 14, ASCH in 1, LSIL in 10, HSIL in 5, while conventional cytology indicated WNL / INFL / REACTIVE in 273 cases, ASCUS in 10, LSIL in 11, HSIL in 6. The presence of blood, inflammation and reduced cellularity led to the exclusion of 20 LBC smears and 15 smears by conventional cytology.

**Conclusions:** 1. Regardless of the applied technique, LBC did not show obvious qualities vs. CS in our study. 2. Inflammatory changes and inflammatory / reactive atypia were more easily appreciated in CS. 3. The clean background and small surface make LBC more easily and faster to examine. However, the reduced number of atypical cells sometimes requires a careful and prolonged examination. 5. LBC using CLEARPREP technique could be taken into account in laboratories that prefer CS replacement, being easy to perform without special equipment. In addition, it is important that the remaining material can be used for HPV determinations and immunocytochemistry.

## P1-18 | Utility of Direct Endometrial Cytology in One Day Gynaecology Clinic

M. Dinter[1]; S. Štemberger-Papić[1]; D. Verša-Ostojić[1]; R. Rubeša-Mihaljević[1]; E. Babarović[2]; M. Manestar[1]; D. Vrdoljak-Mozetič[1]

*[1]Clinical Hospital Centre Rijeka, Rijeka, Croatia; [2]School of Medicine, University of Rijeka, Rijeka, Croatia*

**Objectives:** The aim of this study was to evaluate the role of direct endometrial cytology (DEC) for triage of patients with borderline ultrasound findings in one-day gynaecology clinic. In addition, we calculated the value of DEC in diagnosis of endometrial cancer.

**Methods:** We analysed 694 patients with DEC taken with endometrial brush. Out of the total number, 80 were taken in one-day clinic in patients who did not have clear indication for curettage. Endometrial brush was taken by gynaecologist and samples were analysed within two hours. Depending of the DEC findings, final decision of further procedure was made.

DEC findings were divided into five categories: inadequate, negative, atypical glandular cells, suspicious for malignancy and malignant. Age, menstrual status and cytological-histological correlation were analysed. Cytological findings were compared with pathohistological and / or clinical follow-up for 6 to 36 months.

**Results:** The average age of the patient was 60 years (27–88), of which 586 (84%) were postmenopausal, 73 (11%) perimenopausal and 35 (5%) premenopausal women.

There were 59 (8.5%) inadequate samples. Cytologically negative findings were found in 597 (86%), atypical glandular cells in 22

(3.2%), suspicious for malignancy in 5 (0.7%) and positive finding of malignant cells in 11 (1.6%) patients.

By comparing DEC with histology sensitivity was 73.9%, specificity was 95.3%, positive predictive value was 50% and negative predictive value was 98.3%.

For patients in one-day gynaecology clinic (N = 85) DEC eliminated the need for exploratory curettage in 60 (70.6%) patients, in 25 (29.4%) indicated the curettage.

**Conclusions:** Our results are showing that direct endometrial cytology is reliable in diagnosis of endometrial changes. The negative predictive value of 98.3% indicates a high percentage of findings that do not require invasive procedures.

## P1-19 | Diffuse Large B Cell Lymphoma Cells On Cervicovaginal Smear

E. Tastekin; E. Genc Erdogan; T. D. Yalta; F. Oz Puyan; N. Can; U. Usta; F. Ozyilmaz; A. K. Kutlu

*Trakya University, medical Faculty, Department of Pathology, Edirne, Turkey*

A 46-year-old woman was admitted to our gynecology clinic with mild vaginal bleeding and dyspareunia. On pelvic examination, cervix was found to be hyperemic, hypervascular and painfully. A cervicovaginal smear was send our laboratory. The microscopic examination of Papanicolaou stained cervicovaginal smear demonstrated mature squamous cells, acute inflammatory cells and individual malignant, monomorfic cells between this cell population. These monomorphic malignant cells were found to have an coarsely granular nuclear chromatin, increased nuclear/ cytoplasmic ratio, scanty cytoplasm and irregular nuclear membranes. We diagnosed this case as "malignant cells, not epithelial but probably lymphoid nature". Thereafter, abdominal hysterectomy, unilateral salpingo-oophorectomy and pelvic lymphadenectomy were performed. The cervix, endometrium, myometrium and serosal surface were diffusely infiltrated by malignant lymphoid cells with large, round irregular nuclei, scanty cytoplasm, clumped chromatin and prominent nucleoli. These cells were immunohistochemically positive for LCA, CD 20, CD 79a, bcl 2 and bcl 6. The patient was diagnosed as "Nonhodgkin lymphoma infiltration, diffuse large B cell lymphoma". The whole body screening did not detect any lymphadenopathy or other foci. After the operation, the adjunctive examination of the bone marrow biopsy demonstrated that it was not infiltrated by the lymphoma.

## P1-20 | Prevalence of Chlamydia Trachomatis in Patients With Cervical Intraepithelial Lesion

L. M. Collaco[1,2]; F. F. Scripnic[1]; F. C. Filho[1]; F. A. Barbosa[1]; A. P. Pinto[2]

*[1]Faculdade Evangélica do Paraná-Curitiba-Brazil; [2]Laboratório de Anatomia Patológica e Citopatologia Annalab-Curitiba-Paraná*

**Introduction:** Cervical cancer is the third most common tumor in Brazil. The development of this disease is preceded by a pre-cancerous stage, known as cervical intraepithelial neoplasia (CIN) strongly associated with human papilloma virus (HPV). In the current literature, we discuss a possible relationship *of Chlamydia trachomatis* (CT) with CIN.

**Objective:** This study aims to assess the prevalence of CT infection in patients diagnosed with cervical intraepithelial lesion and its distribution between the low and high grade lesions.

**Methods:** We evaluated the cytological and molecular biology reports of 91 patients with cervical intraepithelial lesion. Of these patients, we obtained the result of hybrid capture exam for CT (negative or positive)- hybrid capture detection of oncogenic HPV (STM, DIGENE Corp., USA). Electronic medical records were compiled data on the age of these patients, cytological diagnosis (low or high degree of injury), presence of metaplasia, endocervix involvement, HPV infection, in addition to the microbiota and degree of inflammation of the cervix. The data, obtained from electronic medical records, were expressed in tables, checking the significance of the relationship between the findings and the infection by CT. Establishing significance of $p < 0.05$ using Fisher test.

**Results:** Of the 91 cases evaluated, 81 were of low grade lesion and 10 high grade lesion, among these were positive for CT in 4 cases of low grade and 1 case of high grade rate which in turn were positive for high-risk HPV ($p = 0.4$). There was no statistical significance in relation to CT infection and the presence of squamous metaplasia ($p = 1.0$); representation endocervix ($p = 1.0$); HPV infection ($p = 1.0$) and; microbiota ($p = 0.3$). However, the degree of cervical inflammation, shown to be related to infection by bacteria ($p < 0.05$). CT+ All women had moderate to severe degree of inflammation, in addition, of the 86 women who were not infected with CT, 68 were classified with slight or no inflammation and only 18, showed moderate to marked inflammation.

**Conclusion:** At present study co infection HPV and CT in intraepithelial lesions was 5.4%, with no significant association ($p = 0.4$) between the presence of both agents and lesions of the cervix.

## P1-21 | Comparison of Thinprep® and Surepath® Methods in Gynecological Cytology

R. Dominguez[1]; A. Cardoso[2]

*[1]Pedro Hispano Hospital, Matosinhos, Portugal; [2]Superior School of Health – Polytechinic of Porto, Porto, Portugal*

Liquid-based cytology (LBC) techniques have emerged with a view to overcoming the limitations of the conventional cervico-vaginal cytology smear method. There are currently several LBC techniques on the market, with ThinPrep® (Hologic, Barcelona, Spain) and SurePath® (Becton Dickinson (BD), Madrid, Spain) being the most sought after by Portuguese Pathology laboratories.

Although these two methods have been the subject of several comparative studies, there have been no comparative studies regarding

both processes' relative efficacy and sample quality for screening purposes. This study has, therefore, the main goal of comparing the processing and screening of cervico-vaginal cytologies preserved and processed using ThinPrep® and SurePath® methods.

To this end, samples were collected from 50 female patients, who between March and April 2017 received a cervico-vaginal cytology at Pedro Hispano Hospital. Two samples of each patient were collected, one preserved and processed by the ThinPrep® method and another by SurePath®. The processing for each method has been protocoled and optimized at Pedro Hispano Hospital according to the recommendations of each supplier.

The processing time of the two methods is variable, according to the number of samples to be processed simultaneously. However, SurePath® is more time-consuming because of base processing in all blood and mucus treatment samples. In ThinPrep® this treatment is optional.

The results obtained for the two methods in all the criteria used to evaluate the quality of the sample were similar, except for the presence of blood and mucus, in which SurePath® showed better results.

## P1-22 | Transitional and Tubal Metaplasia: Pitfalls in Cervical Cytology

C. Fialho; C. Teixeira; P. Leite; T. Amaro
*Pedro Hispano Hospital, Matosinhos, Portugal*

Squamous metaplasia of endocervical epithelium is common and readily recognized on cytological examination. Others types of metaplasia are less frequently seen, and may be mistaken for intraepithelial neoplasia.

We report two cases, one of transitional cell metaplasia which is associated with atrophy and it occurs in peri and postmenopausal women, and the other of tubal metaplasia where endocervical glands that are coated by a mullerian- type epithelium that is similar to fallopian tubes.

A conventional cervical cytology specimen stained by the Papanicolaou method, taken from of a 57-year-old woman, was diagnosed as "atypical squamous cells, can not exclude high grade intraepithelial lesion (ASC-H)". Revision of the cytology following histological examination, demonstrated the features of transitional cell metaplasia consisting of clusters of small epithelial cells bearing nuclei with longitudinal folds, without any cytological atypia.

The second case is a liquid-based cervical cytology stained by Papanicolaou method, taken from a 42-year-old woman and diagnosed as "atypical glandular cells (AGC) of the endocervix". Subsequent histological examination revealed tubal metaplasia and revision of the cytology showed columnar cells with hyperchromatic, pleomorphic nuclei with the features of tubal metaplasia, such as the presence of terminal bars and cilia.

Awareness of these entities, the correct evaluation of the cellular morphological features and the appropriate clinical information, are crucial for the correct diagnosis in cervical cytology.

## P1-23 | Cytologic Features of Gastric-Type Mucinous Carcinoma of the Uterine Cervix

Y. Chun; H. Kim; S. Hong
*Cheil General Hospital & Women's Healthcare Center, Dankook University, Seoul, Korea*

**Objectives:** Gastric-type adenocarcinoma of the cervix (GAS) is an uncommon and aggressive tumor unrelated to human papillomavirus (HPV) infection. It comprises a spectrum from an extremely well-differentiated variant (adenoma malignum) to a more poorly differentiated overtly malignant form. Unlike adenoma malignum, the cytologic characteristics of less differentiated types of GAS has not well studied. This study focused on the cytologic and clinical correlation of GAS.

**Methods:** We reviewed 26 liquid-based cytology (LBC) smears from 20 patients with a histologic diagnosis of GAS.

**Results:** The histologic grade of GAS were 9 adenoma malignum, 2 well differentiated, 6 moderately differentiated, and 3 mixed adenoma malignum and less differentiated GAS. Stage was known in 19 patients; 12 stage I, 3 stage II and 4 stage III.

Initial cytologic diagnoses of 26 LBC smears were as follows: 8 negative for intraepithelial lesion of malignancy(NIL), 1 atypical glandular cells, 4 atypical endocervical cells, 2 atypical endocervical cells favor neoplastic, 1 adenocarcinoma in situ, 3 adenocarcinoma, not otherwise specified, 6 endocervical adenocarcinoma, 1 atypical squamous cells, cannot exclude HSIL (ASC-H). All NIL smears were obtained from 5 patients with stage I adenoma malignum. The cytologic features of adenoma malignum in LBC was not different from conventional smears except golden yellow mucin is not frequently seen. Voluminous clear cytoplasm and distinct cell borders were occasionally seen. Cytologic features suggesting endometrial carcinoma, such as three-dimensional clusters and foamy cytoplasm with intracytoplasmic neutrophil entrapment, were frequently observed in high grade and/or high stage GAS. HPV test was performed in 12 cases and the results were negative.

**Conclusions:** Adenoma malignum was still difficult to make cytologic diagnosis. Cytologically, high grade and/or high stage GAS was often mistaken to endometrial carcinoma. HPV test would be helpful to improve GAS diagnosis.

## P1-24 | Systematic Literature Review on The Effectiveness of Liquid-Based Cytology in Cervical Cancer Screening Programs

D. P. Malinowski
*BD Life Sciences, Durham, North Carolina, USA*

**Objectives:** The use of liquid-based preservatives for the preparation of cervical cytology specimens has been adopted in many national cervical cancer screening programs. The published literature

on the effectiveness of liquid based cervical cytology (LBC) has focused on a single LBC method in comparison to the conventional smear. This review re-examines the effectiveness between different LBC methods.

**Methods:** We undertook a systematic review of literature and the analysis included searching PubMed, PubMed Central, Database for Abstracts of Reviews of Effects, and the Cochran Database of Systematic Reviews from 1999 through 2017 for both relevant controlled clinical trials and observational studies. In addition, a supplemental review was conducted by searching retrieved article references. Metrics of clinical effectiveness included atypical cytology category detection rates; detection of biopsy-confirmed CIN lesions; false negative rates; and unsatisfactory rates.

**Results:** Previous publications comparing LBC to conventional smears have reported a decrease in unsatisfactory results with LBC but also inconsistent conclusions on the clinical effectiveness of LBC. Meta-analyses concluded there was no increased sensitivity using LBC. This new systematic review specifically analysed the clinical performance between LBC methods. Published results from the national cervical cancer screening programs in Denmark and the Netherlands reported an improvement in disease detection with LBC vs. the conventional smear. Furthermore, differences between the various preparation methods were noted with respect to unsatisfactory rates; detection of atypical cytology cases; biopsy confirmed CIN2+ lesions; and false negative rates leading to the appearance of cervical cancer during longitudinal follow-up.

**Conclusions:** This systematic literature review challenges the widespread assumption that there is no difference in the clinical performance of different LBC methods and suggests that large, randomized control clinical trials are warranted to further understand the clinical performance between LBC preservatives, either alone or in combination with HPV testing.

## P1-25 | Unusual Genotypic Distribution of HPV in Black Women With Mixed Infections and Cervical Abnormalities

C. Risley[1]; K. R. Geisinger[1]; L. Zhang[1,2]; S. Raab[1]

[1]*University of Mississippi Medical Center, Jackson, Mississippi, USA;* [2]*Mississippi Department of Health, Jackson, Mississippi, USA*

**Objectives:** 1. To describe an atypical distribution of HPV genotype-specific prevalence in African American women with precancerous and cancerous cervical lesions and mixed genotype infections.
2. To demonstrate the history of smoking with HPV-related disease.
3. To identify the need for HPV-related research on the impact of vaccination and clinical guidelines in this sample.

**Methods:** A retrospective analysis of a statewide sample (Mississippi, U.S.A) of all women with COBAS® 4800 HPV molecular testing in 2013 and 2017 is performed. The variables include age, race, and smoking. The sample is described, and years compared to changes in genotype distribution using descriptive statistics.

**Results:** For 2013 and 2017, 6,449 HPV samples were collected; among those 2,524 (39.1%) were positive. In 2013, 1,271 of 2,782 (45.7%) specimens with ASC-US were positive. Of those, 881 (69.3%) were "other", meaning at least one of 12 lesser known high-risk genotypes are present, 390 (30.7%) were type 16 or 18. In 2017, 1,253 of 3,667 (34.2%) of the co-tested sample was positive, 953 (76.1%) were "other", 300 (23.9%) were type 16 or 18. Adjusting for the sample size increase in 2017, there was a 22.1% decrease in type 16 and 18 and a 9.8% increase in "other".
Of 2,524 positives, 207 (8.2%) were mixed genotype infections. Of those reporting race, 74.4% were Black, 23.2% White, 2.4% other. The 26–29 age group and those 30 and older each comprised 28%; 43.3% are under 25. Smokers accounted for 206 (99.5%) of mixed infections.

**Discussion:** Surprisingly, the proportion of "other", the 12 less common HrHPV genotypes dominates, not type 16 or 18, in this sample of largely Black women. Typically, type 16 and 18 are responsible for 63–70% of cervical cancers. Smoking was exceedingly high in mixed genotype infections. Type-specific prevalence studies is warranted in Black women and smokers.

## P1-26 | High Grade Human Papiloma Virus (HR-HPV) Detection on Liquid Based Cervical Cytology in Women Over 65 Years Old with a Negative Cytology. A Single Institution Retrospective Analysis of 73 Patients

M. María Martino; A. Revuelta; C. Aspiazu; I. Lastra; C. Martinez

*Valdecilla University Hospital, Santander, Spain*

**Objectives:** Cervical cancer is the third most prevalent cancer in women around the world. In this study, we describe our institution's experience with HR-HPV detection on cervical cytology in women over 65 years old with a negative pap test.

**Material and Methods:** All women over 65 years old with HR-HPV detection on liquid based cervical cytology with a negative pap test in 2016 were identified in our department. All correlating surgical pathology reports of subsequent cervical specimens, patient's medical records and cytology samples were review.

**Results:** Of a total of 12,622 pap test, 73 women over 65 years old with HR-HPV and a negative cytology were detected. 21 cases had a biopsy done; 17 cases had a negative result and 3 a low grade cervical neoplasia. 16 cases with a posterior pap test. 1 case had L-SIL and 1 case ASC-H. 26 cases had a posterior HPV testing.

**Conclusions:** In our institution we have 73 women over 65 years old with HR-HPV and a negative cytology and only 28% had a biopsy done and 36% had another cytology done.

## P1-27 | Diagnostic Dilemma: Primary Ovarian Carcinoma or Metastatic Endometrial Carcinoma – A Case Report

S. Katalenic Simon[1]; I. Krivak Bolanca[1]; J. Valetic[2]; A. Skrtic[3]
[1]*University Hospital "Merkur", Zagreb, Croatia;* [2]*Croatian Institute for Emergency Medicine, Zagreb, Croatia;* [3]*University Hospital "Merkur", School of Medicine, University of Zagreb, Zagreb, Croatia*

Endometrial cancer is the most common malignant neoplasm of the female reproductive system. The majority of newly diagnosed patient are detected in the early stages of the disease because the most common first symptom is irregular and/or prolonged bleeding before menopause or, in case of postmenopausal patients – a vaginal bleeding. Also, there is a entity of synchronous primary ovarian and endometrial cancer and it is sometimes difficult to distinguish this entity from metastasis of ovarian or endometrial cancer. It turned out that women in generative age with endometrial cancer have an increased risk of concurrent ovarian cancer and heredity non-polypoid colon cancer. The incidence of synchronous primary ovarian and endometrial cancer has a more favourable prognosis, so it is important to distinguish between these objects due to the correctly chosen treatment and survival of these patients. To distinguish these individuals a detail immunohistochemical analysis must be involved.
We present a case of 49-year old patients with anamnestic data of intense vaginal bleeding and lower abdominal pain. After she was hospitalized an ovarian cyst was discovered by ultrasound. The laparoscopic surgery was performed because of the rupture of the ovarian cyst. During intraoperative analysis, a malignant endometrioid type epithelial cells were found in the porch of Douglas. The operation was converted into laparotomy. Final cytological diagnosis was ovarian carcinoma – endometriod type. The final histological diagnosis was in favour of metastatic cancer of the endometrium into the ovaries, after performing an immunohistochemistry staining. Patients started to receive a chemotherapy according to TC protocol.

## P1-28 | Comparison of Liquid Based Cytology and Conventional Pap Smear for Cervical Cancer Screening

A. H. Samreen-Naz; F. Naveen
*Liaquat National Hospital & Medical College, Karachi, Pakistan*

**Purpose:** Liquid Based Cytology (LBC) is a major advance in cervical cancer screening program. College of American pathologist validated the higher overall accuracy of LBC over conventional smears in term of lower error rates. However this method is not widely used in our country due to limited resources.

**Objective:** The aim of this study is to Compare Liquid Based Cytology (LBC) with Conventional PAP Smear for Cervical Cancer Screening in our setup.

**Material & Methods:** Total 3,929 cases were included in this study who presented in gynecology clinics for cervical cancer screening from January 2012 to October 2017. The percentage of inadequacy and diseases detection rate were compared between specimen prepared by LBC and Conventional methods.

**Results:** LBC methods demonstrated a higher frequency of diseases detection rate of Squamous Epithelial Lesion (2.1% for LBC and 0.2% for Conventional methods). The detection rate of Glandular methods was 0.5% and 0.2% respectively.

**Conclusion:** LBC compared to Pap smear is:
More accurate in the detection of precancerous and cancerous lesion (esp. Squamous Epithelial Lesions). More sensitive for detection of infections and overall cost effective in long term Cervical Cancers Screening.

## P1-29 | Ascus HPV Positive, Results of the Biopsy after the Diagnosis

G. Tagmouti; N. Papaleo; I. Sánchez; L. Díaz; M. Rodrigo; M. González; G. Parini; B. Lloveras; F. Alameda
*Department of Pathology, Hospital del Mar, Barcelona, Spain*

**Introduction:** The recommendations for the screening program of the cervical cancer include the practice of colposcopy and if necessary, a biopsy in positive ASCUS (Atypical Squamous Cells of Undetermined Significance) HPV-HR (Human Papilloma Virus-High Risk) cases, diagnosed by cytology. We present a preliminary study about the results of biopsies practiced in our center.

**Material and Methods:** We reviewed the follow-up of cases diagnosed of ASCUS, HPV positive during a period of four years (2008–2011), in the Pathology service of Hospital del Mar. The following data has been collected : Age, biopsy, conization in case it was practiced, and a subsequent follow-up for two years. The preparation of their cytologies was performed using the ThinPrep platform. And for the diagnosis of ASCUS, the Bethesda criteria were applied. The HPV test was performed by the technique of the second generation hybrid capture.

**Results:** A total of 176 cases were collected with the diagnosis of ASCUS / HPV positive. In all of them, a colposcopy was made, and in 60 cases (61.85%) a biopsy was performed. The mean age of the cases in which a biopsy was practiced was 34 years (19–56). The results of the biopsies were the following: 15 cases were negative (cervicitis) 25%, 32 cases were LSIL, 13 cases were HSIL, of which 10 cases were CIN-II (16.7%) and 3 cases CIN III (5%). From the LSIL cases (diagnosed with biopsy), only 4 of them developed a HSIL in the follow-up (two years follow-up). To HSIL cases, a conization was performed, confirming the diagnosis, and during the follow-up, there was no recurrence of the HSIL lesion.

**Conclusions:** Our results are consistent with the literature,verifying that behind cases of ASCUS-HPV-HR positve, there is a percentage

of HSIL (CIN-III) that should be diagnosed and treated, representing a 2.25% of the total ASCUS-HPV-HR positive cases.

## P1-30 | Small Cell Neuroendocrine Cervical Carcinoma: Our Experience in Two Cases

A. Luís[1]; P. Mendonça[2]; B. Machado[3]; J. Calhau[2]

*[1]CUF Descobertas Hospital, Lisboa, Portugal; [2]Instituto Politécnico de Lisboa, Escola Superior de Tecnologia da Saúde de Lisboa, Portugal; [3]HCA Healthcare UK Laboratories, London, UK*

**Objective:** The small cell carcinoma is the most common neuroendocrine tumor of the uterine cervix. It has been estimated that it may account for approximately 0.3–3% of all cervical carcinomas.

The aim of this communication was to present two case reports of small cell neuroendocrine cervical carcinomas.

**Methods:**

Case 1: A 62 years old woman, whose only clinical data was a suspected cervical sarcoma.

Case 2: A 42 years old woman from who her last smear test was reported as atypical glandular cells.

**Results:** Case 1: The cytology showed numerous groups of a variable number of monotonous, small and round cells, having scarce cytoplasm in a background of diathesis. The nuclei featured molding, hyperchromasia, "salt-and-pepper" chromatin and no nucleoli. Similar observations could be found with the biopsies, where atypical gland-like groups were also detected.

The histology showed positive immunostaining for neuron specific enolase, synaptophysin and cytokeratin (AE1/AE3 clone antibodies) and a high proliferative activity demonstrated by the nuclear marker Ki67/Mib1 immunoreactivity.

Case 2: Cytologically, a very haemorrhagic sample was observed with cells occurring in sheets and strips, with some cell crowding, nuclear overlapping and/or pseudostratification. Distinct cell borders were often discernible. Simultaneously, it showed few groups with monotonous, small and round cells, having scarce cytoplasm. Some nuclei featured molding and hyperchromasia.

The immunohistochemical profile of the biopsy was evaluated, showing a positivity for synaptophysin, CD56, cytokeratin AE1/AE3 (focal and in situ) and p63 (light and focal).

**Conclusions:**

Case 1: The cytological, histological and imunohistochemical findings were consistent with the final diagnosis of a small cell neuroendocrine carcinoma.

Case 2: The aspects observed in cytology resulted in atypical glandular cells, but histological and imunohistochemical findings were consistent with the diagnosis of a small cell neuroendocrine carcinoma.

## P1-31 | Which Molecular Marker Between P16INK4A and Ki67 are a Valuable Aid to Graduate Cervical Lesions on Histological Specimens

F. Zanconati[2]; M. Di Napoli[1]; E. Isidoro[1]; A. Basso[3]; D. Santon[3]; A. Romano[1]; F. Giudici[2]

*[1]U.C.O. Pathology Unit, ASUITS Cattinara Hospital – Trieste; [2]University of Trieste Department of Medical, Clinical and Surgical Sciences; [3]University of Trieste Course of Study for Biomedical Technician*

**Objective:** The purpose of this study was to evaluate and correlate the expression of p16INK4a (p16) and ki 67 on histological specimens diagnosed as negative, cervical intraepithelial neoplasia (CIN) and squamous and glandular invasive lesions, to see which of them better defines the degree of the lesion.

**Methods:** We analyzed 51 biopsies of patients in follow up after positive Pap Test (13 ASCUS, 22 LSIL, 3 ASCH, 7 HSIL, 6 invasive lesions), who have been diagnosed as: 7 negative, 21 CIN1, 7 CIN2, 10 CIN3, 2 squamous invasive carcinoma and 4 endocervical adenocarcinoma. The expressions of p16 and Ki-67 were evaluated by immunohistochemical methods using p16 and Ki67 antibody. The results were classified into four scores: 0 if positivity is less than 5%, 1 positivity between 6% and 25%, 2 positivity between 26% and 75%, 3 positivity more than 76% (1)

**Results:** The expression of p16 ($p < 0.0001$) and Ki-67 ($p = 0.001$) were positively associated with degree of lesions, the expression of p16 was not observed in all specimens classified as negative (7/7, 100%) and increased significantly with the degree of the lesions. On 21 biopsy classified as CIN1, 13 of them had a score of 0 (positivity less 5%), 8 biopsy of CIN1 positivity were scored as 1–2 and no case of CIN1 had a score of 3. While only 2 biopsies on 7 diagnosed as CIN2 showed a positivity less than 5% and 5 biopsies more than 26%. Finally all cases classified as CIN3 and invasive lesions had a positivity greater than 75%. Ki67 is expressed also in negative cases (3 of 7 negative biopsies) and doesn't have a progressive course.

**Conclusion:** The introduction of new molecular marker p16 allowed to better assess the degree of the lesions, so it has allowed us to better identify lesions to treat than Ki67.

**Reference:**

1. S. Nicholas Agoff, MD, Patricia Lin, MPH, Janice Morihara, BS, Costance Mao, MD, Nancy B Kiviat, MD, Laura A, Koutsky, PhD. "p16 expression correlates with degree of cervical neoplasia: a comparison with ki67 expression and detection of high-risk HPV Types". *Mod pathol* 2003;16(7):665–673.

## P1-32 | Histology as a Gold Standard of Cytology: The Use of the P16 Marker Can Improve Interobservator Reproducibility of Preneoplastic Lesions

L. Di Bonito[2]; M. Di Napoli[1]; E. Isidoro[1]; A. Basso[3]; D. Santon[3]; A. Romano[1]; D. Bonazza[1,2]; M. Pinamonti[4]; F. Giudici[2]; F. Zanconati[1,2]

[1]*U.C.O. Pathology Unit, ASUITS Cattinara Hospital – Trieste;* [2]*University of Trieste Department of Medical, Clinical and Surgical Sciences;* [3]*University of Trieste Course of Study for Biomedical Technician;* [4]*University of Trieste School of Specialization in Pathological Anatomy*

Histology is considered the gold standard of cytology but the histopathologic interpretation of prenoplastic lesions (CIN cervical intraepithelial neoplasia) is subject to a high level of interobserver variability. The results might be improved by a more specific diagnostic biomarker. The use of p16 protein could help to reduce variation in interpretation of cervical lesions (1).

**Material and Methods:** To test this hypothesis, 50 cervical histological samples (6 negative, 22 CIN1, 6 CIN2, 10 CIN3, 6 invasive lesions) were selected from of routine of the histopathology laboratory of Trieste. Two consecutive sections from each histological specimens were stained with hematoxylin and eosin H&E and with a p16 -specific monoclonal antibody, respectively. Four pathologists with different work experience, examined the specimens, to classify used the CIN classification and after the same classification with use of p16 protein. The agreement in the diagnosis between observers was calculated by Cohen kappa statistics.

**Results:** All 50 slides, stained in H&E were reviewed blindly by 4 pathologists and were classified with CIN classification. The interobserver kappa values ranged from 0.58 to 0.69 (95% CI 0.42–0.74, 0.53–0.84). Significant discrepancies were observed in the diagnostic interpretation of CIN2 category. A higher concordance was obtained from the diagnosis with the use of the p16 protein, the kappa values ranged from 0.73 to 0.88 (95%CI 0.58–0.89).

**Conclusion:** The use of p16 increases the reproducibility between pathologists, it better identifies negative samples like squamous metaplasia and tubaric metaplasia. P16 immunohistochemistry can reduce false-negative and false-positive biopsy interpretation and thereby significantly improve interobservator reproducibility of preneoplastic lesions.

**Reference:**

1. Songkhun Vinyuvat et al. Interobserver Reproducibility in Determining p16 Overexpression in Cervical Lesions : Use of a Combined Scoring Asian Pacific. *Journal of Cancer Prevention*, Vol 9, 2008, 653–657.

## P1-33 | Papillary Carcinoma of Thyroid in Pediatric Age. A Case Report

D. Estrada Canjura[1]; D. Pérez Martínez[1]; B. Romero Madrid[1]; J. M. Soria[1]; B. W. Lara[2]; M. Fernandez del Corral[1]; M. M. Arias[1]

[1]*Hospital Regional Universitario, Málaga, Spain;* [2]*Hospital Materno Infantil, Málaga, Spain*

**Objectives:** Report a case of a thyroid carcinoma in a pediatric age. This kind of tumor are infrequent presentation in pediatric population. In the database of our hospital we have only four cases since 1989.

**Methods:** Our patient is a 8-year-old girl admitted to our hospital for a 3-month evolution of the right painless hard consistency latero-cervical tumor which was accompanied by loco-regional adenopathies. No other symptoms were reported. Serology negative and TSH suppressed with T3 and T4 at the highest limit of normality. Ultrasound and CT were performed with a contrast dye evidencing probably malignant thyroid nodule (TIRADS 5) with ipsilateral cervical adenopathy dissemination.

**Results:** Fine-needle aspiration cytology (FNA) confirmed the suspicion of thyroid carcinoma (Bethesda IV), suggestive of follicular neoplasia. In addition, lymph node FNA was performed in which thyroid follicular cells without evident colloid were observed, with a low lymphoid population.

A needle core biopsy is performed and a thyroid neoplasm with follicular pattern and foci of micropapillary configuration is evidenced. Presence of occasional intranuclear inclusions, nuclear clefts and Psamoma bodies together with an immunohistochemical profile compatible with papillary neoplasm ($CD56^{-}$, $CK19^{+}$, Galectin $3^{+}$, $HBME\text{-}1^{+}$, $TTF1^{+}$, $Thyroglobulin^{+}$).

With this result the patient underwent total thyroidectomy and histopathological analysis revealed papillary carcinoma, classic variant, with isolated foci with follicular differentiation, capsular and vascular invasion in right thyroid lobe and very few scattered nests of papillary carcinoma in left thyroid lobe without evidence of capsular or vascular invasion, althought cervical ganglionar metastasis were present.

**Conclusions:** The Bethesda System for Reporting Thyroid Cytopathology allows for individual risk stratification, but a significant number of nodules are indeterminate. Molecular mutations were most frequently associated with papilary carcinoma, These results suggest a clinical role for mutational analysis of pediatric nodules to guide the surgical approach.

## P1-34 | Analysis of Cervical Liquid-Based Cytology Diagnosis In Eskişehir, Turkey: Correlation of Cytology Results With Histology, Immunocytocemicalhrhpv and HRHPV DNA Results of 18,404 Women

B. Erdoğan[1]; S. Kabukcuoğlu[2]; C. Bal[2]; B. Onal[3]

[1]*Eskişehir State Hospital, Eskişehir, Turkey;* [2]*ESOGU Medical Faculty, Eskişehir, Turkey;* [3]*Cancer Registry WG, Pathology Federation, Ankara, Turkey*

**Objectives:** The retrospective analysis and correlation of cytology results with histology outcomes, immunocytocemical hrHPV and hrHPV DNA data of 18,404 women.

**Methods:** This study included the cytological results of the patients who applied to the hospital's gynecology outpatient clinic and underwent liquid-based cytology testbetween the years of 2014 and 2017.For the histopathological diagnoses of the cervical biopsy specimens and hrHPV-DNA results of the patients, electronic records of the hospital and ESOGU Medical Faculty Pathology Department were recorded. For ISC tests, a modified Ultra Vision Quanto Detection System and hrHPVAb3 (K1H8) were used and for hrHPV-DNA tests, Qiagen Hybrid Capture test was performed. The data was analyzed with the IBM SPSS Statistic 24 program.

**Results:** 19,403 cases were evaluated in this study. The 998 samples consisted of recurring smears and have been excluded from study group. 18,404 patients were included in the final study. The percentage of smears showing epithelial cell atypia is around 3.4% and ASC-US:1.9%, ASC-H:0.2%, LSIL:0.9%, HSIL: 0.1%, AGC:0.3% and Ca: 0.01%. Out of 152 cervical biopsy cases, 42.1%of them were benign, 36.8% were LSIL, 5.9% were HSIL and 5.9% were diagnosed as carcinoma. ISC hrHPVAb applied on total of 138 patients, 58.7% patients were negative and 41.3% patients displayed positive results. Sensitivity and specificity rates are (83.3%–52.17%) and (21.3–85.71%) in LSIL and HSIL cases, respectively. Within the 53 HPV-DNA results, 53.7% of them were negative and 46.3% were positive. Sensitivity and specificity rates are (83.33%-50.17%) and (100%-50%)respectively, in the cases of LSIL and HSIL.

**Conclusions:** Immunocytochemical hrHPVAb staining made a statistically significant contribution to the diagnosis of LSIL (Chi-SquareTest,0.042%). We think that ISC HPV Ab staining will provide additional evidence for morphological findings and that it can help the clinical management of the disease.

# P2 HPV CERVICAL SCREENING

## P2-1 | Clinical Risk Evaluation For High-Grade Cervical Lesions In Follow-Up Biopsy Analysing HPV DNA Versus HPV MRNA Tests in LBC Cervical Samples

M. Nasioutziki[1]; P. Hatzis[1]; N. Tsampazis[1]; G. Pratilas[1]; E. Athanasiou[1]; V. Karpa[1]; A. Charizani[1]; A. Daniilidis; A. Papanicolaou[1]; K. Dinas[1]

[1]*Molecular Clinical Cytopathology Laboratory, 2nd Obstetrics & Gynecological Department, Hippokration General Hospital, Medical School Aristotle University of Thessaloniki Greece*

**Objectives:** The aim of this study was to analyze the clinical performance of two validated FDA approved HPV testing platforms in risk assessment for high-grade intraepithelial cervical lesions (CIN2+).

**Methods:** 3,892 Pap tests with follow up biopsy confirmation were analyzed along with HPV tests performed by Hybrid Capture 2 HPV DNA (HC2, Qiagen) or APTIMA HPV mRNA (AHPV, Hologic) platforms on LBC Thin Prep cervical samples (Hologic) between January 2017 and January 2018.

**Results:** 3,205 and 687 Thin Prep cervical samples were tested by HC2 and AHPV platforms respectively. The sensitivity rates for biopsy-confirmed HSIL+ lesions were high for both tests (97.8% and 96.4% for HC2 and AHPV, respectively, $p = 0.51$). Between the two HPV tests (HC2 vs AHPV), HC2 showed higher positivity for diagnosis on biopsy of benign (86.8% vs 55.6%) and LSIL (89.6% vs 65.8%), while AHPV showed significantly higher specificity for HSIL+ compared to HC2(38.8% vs 12.8%, $p < 0.0001$). As a result, AHPV platform showed significantly higher PPV (25.8% vs 15.8%, $p < 0.0001$) and overall accuracy (49.5% vs 24.9%, $p < 0.0001$) compared to HC2 in detecting biopsy-confirmed HSIL+.

**Conclusions:** Aptima HPV mRNA testing demonstrated significantly higher specificity and positive predictive values than HC2 HPV DNA testing in detecting biopsy-confirmed HSIL+ lesions, although both HPV tests offer comparably high sensitive rates. Significant increase in E6/E7 expression following HPV DNA integration in HSIL+ may be the reason explaining this considerable difference. Higher specificity along with PPV, overall accuracy & partial genotyping of Aptima HPV mRNA test in detecting HSIL+, as well as along with women's lifestyle or cytology information, have clinical utility in risk evaluation/stratification and management for identifying populations at high-risk for HSIL+ that need further investigation or personalized decisions for treatment.

## P2-2 | Prevalence and Type Distribution of High Risk (HR) Types of Human Papillomavirus (HPV) in Women at Pre – Vaccine And Post – Vaccine Period

M. Gavriil; Ch. Stavridis; S. Mpoutou; K. Kampitsis; M. Tzanopoulou
*Maternity Hospital "Elena Venizelou", Athens, Greece*

**Objectives:** Infection by high risk (HR) human papillomavirus (HPV) is a necessary cause of cervical cancer.

The aims of the study were to monitor changes in HPV-HR type-specific prevalence after the introduction of vaccination and whether the reduction of the high risk vaccine types may lead in type replacement in women population.

**Methods:** Samples (ThinPrep) from 2,495 non vaccinated women between 20 to 65 years age, with a previous abnormal pap smear were collected by the cytology laboratory between 2005 and 2010 (pre-vaccine period) and 1905 samples between 2011 and 2017 (post-vaccine period). HPV-genotyping was performed to all samples by Clinical Arrays2 kit.

**Results:** Of the first group 1,282 samples (51.3%) were positive for at least one HR-HPV type. Of the second group 1,082 samples (56%) were positive for at least one HR-HPV type. The crude prevalence of all HR-HPV types in both groups is shown at the following table.

**TABLE 1** Crude prevalence HR-HPV types

| HR-HPV type | 1st group (%) | 2nd group (%) | Change (1st–2nd) |
|---|---|---|---|
| 16 | 14.35 | 9.69 | −4.66 |
| 18 | 7.64 | 4.60 | −3.04 |
| 31 | 11.85 | 9.20 | −2.65 |
| 33 | 8.03 | 2.95 | −5.08 |
| 35 | 2.26 | 2.88 | 0.62 |
| 39 | 2.73 | 3.60 | 0.87 |
| 45 | 2.26 | 1.56 | −0.70 |
| 51 | 8.03 | 9.60 | 1.57 |
| 52 | 6.78 | 8.60 | 1.88 |
| 56 | 4.05 | 6.00 | 2.00 |
| 58 | 7.09 | 6.74 | −0.35 |
| 59 | 5.38 | 7.29 | 1.90 |
| 66 | 3.74 | 3.69 | −0.17 |
| 68 | 3.74 | 3.69 | −0.05 |

**Conclusions:** Data suggest that there is a percentage reduction in the prevalence of HPV types 16 and 18 even in non vaccinated women (4.66 (n = 184) and 3.04% (n = 105) respectively) thanks to herb immunity. In addition, HPV type replacement does not occur among study's population within five years so it is unlikely to occur in population generally. The changes in HPV prevalence rates underline the importance of HPV vaccination.

## P2-3 | Corellation Between Cytologic, Histopathologic Examination And Hpv Status In Cervical Intraepithelial Lesions

C. Psachoulia[1]; E. Mpota[1]; D. Koumoundourou[1]; G. Michail[2]; I. Nikolatou[3]; M. Kardari[1]; P. Ravazoula[1]
*University Hospital of Patras, and Unit of Health and Social Welfare Management TEI of Athens3, Greece*

**Introduction:** The purpose of the present study was to compare cytologic (PAP-TEST) findings, histopathologic evaluation (cervical biopsies) and the presence of HPV viruses in cervical specimens.

**Materials and Method:** 136 women who had underwent a pap-test and a cervical biopsy were included in the study. The presence of high or low risk HPV subtypes had also been documented.

**Results:** A strong correlation was found between the presence of LGSIL as well as HGSIL in pap-test and tissue biopsy ($p < 0.001$). High risk HPV subtypes were associated with the presence of either LGSIL or HGSIL in tissue biopsies ($p < 0.001$). Association was between ASCUS cells in PAP smears and presence of high risk HPV subtypes, approached borderline ($p = 0.055$). In many patients with ASCUS cells in PAP smear identification of HPV in DNA test, as well as a diagnosis of LGSIL or HGSIL was made in tissue specimens.

**Conclusions:** When ASCUS cells are found in cytologic interpretation a tissue biopsy should be interpreted because in a considerable number LGSIL or HGSIL will be diagnosed. These findings imply that HPV DNA is a necessity in cervical screening.

## P2-4 | Comparison of Two Methods Of HPV Primary Screening In A Population Screening in the South Of Portugal

P. Sequeira; M. J. Brito; A. Quintas
*Hospital Garcia de Orta, Almada, Portugal*

**Objectives:** To study the sensitivity of 2 methods of HPV Primary Screening (DNA and mRNA) in a Pilot Population of the South of Portugal.

**Methods:** During the last four months of 2016, 943 women (aged between 25–60 years) from 4 Health Centers of the Setubal District (south of Portugal) were screened for High Risk HPV using a DNA HPV test (COBAS® – n = 639) and mRNA test (Aptima® – n = 304) carried out on Liquid Based Cytology (Thin Prep®). Both tests detect HPV 16, HPV 18 and a panel of other High Risk HPV. The distribution of women between the different age groups was similar in the two methods. Data were analyzed by Chi-square statistic test.

**Results:** HPV high risk DNA was detected in 10% of the women: 20% HPV 16, 3% HPV 18 and 76% of other High Risk HPV types (of these NILM-619; ASC-US-12; LSIL-4; ASC-H-3; HSIL-1).

HPV high risk mRNA was detected 8% of the women: 25% HPV 16, 8% HPV 18/45 and 58% of other High Risk HPV types (of these NILM- 294; ASC-US- 4; LSIL-3, ASC-H-1, HSIL-1).

There was no statistic difference in global positivity between the two methods, neither for the percentage of positive cases for the different types of High Risk HPV detected.

**Conclusions:** In our pilot population, the results obtained with the two HPV primary screening methods (COBAS® and Aptima®) are similar and in keeping with what has been previously reported.

Follow up data on colposcopy and biopsy findings, of patients with positive HPV 16, HPV 18, HPV 18/45, and Other High Risk HPV types, may elucidate further, on the specificity of each method.

## P2-5 | HPV Negative Cases from HPV Screening Programme: Cyto-Histological Correlation

S. Kares[1]; P. Kujala[1]; I. Kholová[1]; R. Vuento[1]; M. Tirkkonen[1]; O. Veijalainen[2]; J. U. Mäenpää[3,4]

*[1]Fimlab Laboratories Ltd, Tampere, Finland; [2]Päijät-Häme Central Hospital, Lahti, Finland; [3]Tampere University Hospital and Tampere, Finland; [4]University of Tampere, Tampere, Finland*

**Objectives:** Since 2012, high risk HPV testing with cytology triage has been used In Finland by Fimlab Laboratories Ltd. as the primary screening method in the cervical cancer screening programme for women ≥ 35 years.

**Methods:** HPV was tested with Abbott RealTime High Risk HPV test that detects 14 high-risk HPV genotypes (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68). In addition to all positive slides, the Laboratory Information Management System randomly selected 10% of HPV negative cases, whose cytology slides were screened. Out of 57,301 cases, 5,477 (10.33%) cytology slides were evaluated.

**Results:** The proportion of normal cytology (NILM) in the HPV negative cases was 96%. Borderline cytology (ASC-US) was found 2.7%. Six cases were graded as LSIL and five as HSIL, and they were referred to colposcopy, resulting in one biopsy proven CIN3. More detailed studies revealed HPV genotype 69 in this particular case. This genotype is not included in the test used.

**Conclusions:** Only one false negative case (0.018%) was found, which was due to HPV genotype 69. This genotype is considered only as possible carcinogen and is not included in the test. According to the results, the primary HPV test with reflex cytology for HPV positive cases is an efficient and specific method for cervical cancer screening.

## P2-6 | A Single Center Retrospective Study of High Risk HPV Incidence

P. Luís; S. Ortiz; I. Andrade

*Pathology Department, Hospital Distrital de Santarem, Portugal*

**Objectives:** In our community, HPV 16 is the most frequent high-risk HPV detected, and with a higher incidence of high-grade lesions. Our goal was to investigate the distribution of high-risk HPV, and correlation with findings in liquid based cytology.

**Methods:** Between 2006 and 2017, 815 cytological specimens were positive for high-risk HPV, with a PCR test that detected HPV 16, HPV 18 and other high risk HPV. 134 patients had more than one determination (maximum 4 determinations).

**Results:** HPV 176 was detected in 25% of cases (19% individually and 6% in co-infection); HPV 18 in 5% of cases (2.5% individually and 2.5% in co-infection) and the remainder 70% were other high risk HPV. Among the other high-risk HPV, subtypes 51, 53 and 31 were the more frequent. Of the 134 patients with more than one determination, HPV subtype detected changed in 83% of them; in the remainder 17% were there was persistence of a subtype infection, 65% of them were other high-risk HPV. In the HPV 16+ cases, 63% were NILM on cytology, 19% ASC-US, 2% AGC, 11% LSIL, 5% HSIL; in HPV18+ cases, 76% were NILM on cytology, 5% ASC-US, 12% LSIL and 7% HSIL. In other high-risk HPV, 68% were NILM on cytology, 15% ASC-US, 1% AGC, 2% ASC-H, 12% LSIL and 2% HSIL.

**Conclusions:** In our study, the other high-risk HPV group was the one with higher incidence, but only 2% revealed high grade lesions. However we found, in cases of more than one determination, persistence of one subtype of high-risk HPV, raising the probable importance of an HPV test that can differentiate between the different high-risk HPV subtypes.

## P2-7 | A Retrospective Study on All Invasive Cervical Squamous Carcinoma (CC) Classified On Histological Specimens From 2010 To 2017 To Identify Which Type of HPV is Envolved

L. Di Bonito[2]; M. Di Napoli[1]; E. Isidoro[1]; D. Santon[3]; P. Carli[3]; C. Biagi[1]; A. Romano[1]; F. Giudici[2]; D. Bonazza[1,2]; F. Zanconati[1,2]

*[1]U.C.O. Pathology Unit, ASUITS Cattinara Hospital – Trieste; [2]University of Trieste Department of Medical, Clinical and Surgical Sciences; [3]University of Trieste Course of Study for Biomedical Technician*

The etiological role of HPV in cervical tumors has stimulated the interest of scientific research aimed both at identifying new diagnostic tests to be used for screening, and in the vast field of vaccinoprofilaxis. The aim of the work was to conduct a retrospective research on all biopsy classified as invasive cervical squamous carcinoma (CC) received at the S.C. of Anatomy and Pathological Histology of Trieste from the year 2010 to 2017.

**Materials and Methods:** Our study includes 42 histological specimens, formalin fixed and paraffin embedded. Of 42 patients, one did not have a documented invasive squamous lesion and poor material to perform the molecular biology investigations, this was excluded from the study. Molecular investigations identified the HPV genotype through the "PyroMark Q96 ID system", pyrosequencing.

**Results:** Genotyping was performed on 41 samples: of 2 patients we had only one biopsy preparation unsuitable for molecular investigations (NT), one sample was negative. The genotyping results are: 26 (66.7%) patients with HPV16, 3 (7.7%) with HPV18, 2 (5.1%) with HPV33, HPV73 and HPV45 respectively, while HPV31, HPV58, HPV67 were found in one patient with CC.

**Conclusions:** The most represented viral genotype is HPV16 (66.7%) a higher percentage compared to other studies reporting 58% -62.1% [(1-3)]. HPV 18 was found in 7.7% of the cases. Other genotypes were found in our population as the genotype 67 defined as intermedie risk, but it turned out to be the etiologic agent of an advanced neoplasm that led to the patient death; as well as the HPV 73 was identified in two patients, one of which died.

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## P3 LYMPH NODE CYTOLOGY

### P3-1 | Follicular Dendritic Cell Sarcoma: A Diagnostic Challenge on Cytology. A Report of Four Cases

A. Freih Fraih[1]; C. Gordillo[1]; M. Adrados[1]; C. López Elzaurdia[1,2]; P. Fernández-Rico[1]; A. Mingo[1]; J. A. Jiménez Heffernan[1,2]

*[1]University Hospital La Princesa; [2]Labco Pathology, Madrid, Spain*

**Objectives:** Follicular dendritic cell sarcoma (FDCS) is a neoplasm of spindle to ovoid cells that show features of follicular dendritic cells. It is a rare tumor that can show nodal and extranodal involvement. On cytology its diagnosis is particularly difficult. Approximately 15 previous cytologic reports are available and diagnosis was only possible on recurrences or metastases. We describe our experience with four cases of this peculiar neoplasm.

**Methods:** The patients were four adults. Three tumors were located in cervical lymph nodes and one in a mediastinal hiliar node. The latter was suspected to correspond to a pulmonary carcinoma and was evaluated using EBUS-TBNA. One cervical case corresponded to a recurrence of a previously diagnosed tumor.

**Results:** Smears were hypercellular and showed abundant single cells and aggregates of large tumoral cells with round to ovoid nuclei. The cytoplasm was scarce. Cells showed moderate nuclear pleomorphism and mitotic activity. In addition to tumoral cells, all cases showed lymphocytes and plasma cells. Single cells often adopted round epitheliod morphology while spindle cell morphology was better appreciated inside the aggregates. Macrophages were also present. We did not suspect the possibility of FDCS so immunocytochemistry was not aimed to this diagnosis. Two cases were diagnosed as poorly differentiated malignant neoplasms (cytokeratin -). The pulmonary case was erroneously diagnosed as large cell carcinoma (TTF1 and p63 -). All cases had a subsequent complete histopathologic and immunohistochemical study performed by two expert hematopathologists.

**Conclusions:** The cytologic recognition of FDCS is very difficult especially in extranodal locations. Since morphologic suspicion is critical for deciding the immunocytochemistry panel morphologic clues are of capital importance. The oval to spindle cell morphology, better seen inside the aggregates and the lymphoid cell population should raise this diagnostic possibility. Cytology is very useful for the diagnosis of metastases and recurrences.

### P3-2 | Cytodiagnosis of Fungal Lesion – A Case Series

V. Raphael; Y. Khonglah; J. Mishra; E. Marbaniang; K. Raghini

*North Eastern Indira Gandhi regional Institute of Health & Medical Sciences, Shillong, Meghalaya, India*

**Objectives:** The incidence of fungal has increased considerably in the recent years. However, the diagnosis of fungal lesions by Fine Needle Aspiration Cytology (FNAC) is still rare. This study is conducted to study the potential of FNAC in the diagnosis of fungal lesions.

**Methods:** Retrospective retrieval of five FNAC proven fungal lesions in the body (superficial and deep) presented to NEIGRIHMS in the last two years was analyzed.

**Results:** FNAC was obtained from cervical lymph-nodes (2), abdominal lymph-nodes (2) and lung (1). The fungal infections included aspergillosis (1), histoplasmosis (2) and cryptococcosis (2). The various organisms were confirmed by special stain whenever required.

**Conclusion:** FNAC is an easy, reliable, and minimally invasive method to diagnose and categorize various fungal lesions in the body for early and definitive treatment.

### P3-3 | The Diagnostic Accuracy of Fine Needle Aspiration for the Detection of Axillary Breast Cancer Metastasis

T. Domingos[1]; T. Da Costa[1]; R. G. Pastorello[1]; L. De Brot[1]; C. Destefani[1]; M. De Brot[1]; S. Bezerra[1]; C. De Toledo[1]; M. A. Saieg[1,2]

*[1]A.C Camargo Cancer Center, São Paulo, Brazil; [2]Santa Casa Medical School*

**Objectives:** Fine needle aspiration (FNA) of axillary lymph nodes in patients diagnosed with breast cancer is a minimally-invasive method for optimizing patient clinical follow-up. The purpose of this study was to compare the results of the cytological exams by FNA with the histological analysis of the surgical specimen.

**Methods:** We retrospectively assessed patients with a confirmed diagnosis of breast cancer who underwent FNA of radiological suspicious axillary nodes, from September 2015 to August 2017, followed by axillary lymphadenectomy or sentinel lymph node dissection. Data collected included age at the time of diagnosis, primary breast excision diagnosis, location of the node and final cytological and histological diagnoses. Only cases with conclusive (positive or negative) final FNA diagnoses and no evidence of chemoterapy effect were used for agreement assessment and evaluation of FNA's overall accuracy.

**Results:** The study consisted of 342 patients, with age ranged from 27 to 85 years, (mean 49.6 years). Among these patients, 181 (52.9%) performed FNA of a left axillary node, and 161 (47.1%) of a node in the right axilla. In 275 (80.4%) cases, the primary histological type of breast cancer was invasive ductal carcinoma, followed by invasive lobular carcinoma in 35 (10.2%) cases and other special types in the remaining 32 (9.4%) cases. FNA yielded a positive diagnosis in 178 (52%) cases, negative in 148 (43.3%) and suspicious for malignancy in 16 (4.7%) cases. Proper cyto-histological correlation was feasible in 289 cases, with complete agreement in 246 samples (85.1%). The sensitivity, specificity. PPV and NPV of FNA was 81.65%, 88.64%, 89.6% and 80.14% respectively, with an accuracy of 84.83%.

**Conclusions:** FNA is a very sensitive and specific method for the diagnosis of metastatic breast cancer in axillary lymph nodes, with high diagnostic accuracy and agreement to the final histological diagnosis.

## P3-4 | The Complex Morphological Diagnostics of Marginal Zone Lymphoma

E. Slavnova[1]; S. Golovin[2]

*[1]The P.A. Herzen Moscow Research Oncologic Institute; [2]The Clinical Hospital "The Moscow Medical Sanitary Unit of the Interior Ministry"*

**Objectives:** To determine the possibilities of complex morphological diagnostics, immunocytochemistry (ICC) and immunohistochemistry (IHC), molecular genetics) of the marginal zone lymphoma (MZL).

**Methods:** The study included 10 patients with morphological, immunomorphological and molecular genetic methods for studying the diagnosis of MZL. The antibody panel included: a common leukocyte antigen, common cytokeratins, CD19, CD20, CD79a, CD10, Bcl2, Bcl6, CD23, CD34, TdT, CD3, CD4, CD5, CD8, CyclinD1, Ki67, κ, λ. A FISH method was used with probes Bcl2 and MALT1.

**Results:** Cytological examination of 10 cases allowed to establish an accurate diagnosis of lymphoma in only 5 of them. In 2 cases with a cytological examination, only suspicion of lymphoma was expressed. All 10 patients had positive expression CD19, CD20, CD79a. In 6 patients, positive expression of Bcl2 was observed. No expression of CD5, CD3, CD10, CD34, CD23, Bcl6, TdT, cyclin D1. In IHC and ICC in 10 cases, the protein of Ki-67 proliferative activity was no more than 30%. With flow cytofluorimetry, clonality was determined for light chains of immunoglobulins κ or λ. In general, the correlation coefficient (r, $p < 0.05$) between the IHC and ICC data, flow cytometry is 1. Four patients were subjected to a FISH response to clarify the diagnosis. Rebuilding of the Bcl2 gene in a patient with nodal lymphoma of the MZL was not detected. In three patients the MALT1 gene was rearranged.

**Conclusions:** The accuracy of the routine cytological study in establishing the diagnosis of lymphoma without indicating its type MZL was 50%, sensitivity – 50%, specificity – 100%. The accuracy of immunophenotyping, was 100%, sensitivity – 100%, specificity – 100%. The correlation coefficient (r, $p < 0.05$) between the IHC and ICC, flow cytometry is equal to 1. The accuracy of the complex study (cytology, immunocytochemistry and FISH-method) in diagnosis of LMZ were 100%.

## P3-5 | Fna Cytomorphology and Cell Block Study in the Diagnosis of Follicular Dendritic Cell Sarcoma – Study of Four Cases

A. Nargund; B. Sadasivan; A. Patil; M. Malathi

*Kidwai Cancer Institute, Bengaluru, Karnataka, India*

**Objective:** Follicular dendritic cell sarcoma (FDCS) is a rare neoplasm arising from follicular dendritic cells of germinal centers. The most common site of origin is lymph nodes and it may mimic a variety of tumors at that location, including metastatic carcinomas and sarcomas. Diagnosis is frequently missed on cytology as there are very few case reports describing the cytological characteristics of the lesion. Here we elaborate utility of FNA and cell block in the diagnosis of FDCS.

**Materials and Methods:** We report four cases of FDCS from regional cancer centre that were diagnosed by FNA & Cell block. Four cases of FDCS were retrieved from the cytology register. FNA & cell block was performed from following sites, right parapharangeal mass, tonsil, cervical lymph node,liver and abdominal lymph node .Age ranged from 25 to 55 years. Three were males & one female. FNA was performed & Cellblock preparation was done by using formalin method

**Results:** Cytomorphology showed plump ovoid to spindle cells, in vague swirling / whorl pattern and also discohesive cells, with vesicular nucleus, small distinct nucleoli. Numerous lymphocytes were sprinkled in between and were also seen in few aggregates. IHC showed the tumor cells to be positive for CD 21, 23 in all

4 cases. IHC on cell blocks was confirmed in two cases. One case was a recurrent tumor and diagnosis was made on FNAC & correlated with biopsy. However in one case of tonsillar mass a possibility of FDCS was rendered and suggested histopathology study and was confirmed the same. Patients were started on chemotherapy.

**Conclusion:** This study emphasizes the importance of FNAC cell block in the diagnosis of FDCS. Cell block can be taken for further ancillary tests like immunohistochemistry.

## P3-6 | Ultrasound-Guided Fine Needle Aspiration of Lymphatic Node Performed by Pathologist. Procedure Optimization

A. Alonso Fernández-Velasco; L. A. Pérez Pavón; C. Miguel Ruiz; I. Husain; S. J. Sánchez Luizaga; L. M. Fernández Fernández; R. E. Ugalde; N. Z. Ortiz; H. E. Torres Rivas

*Hospital Universitario Central de Asturias. Oviedo, Principado de Asturias, Spain*

**Introduction:** Fine needle aspiration (FNA) is a simple and highly efficient technique, which in many cases enables pathologists to diagnose with confidence. The development of image tests via the use of ultrasound has made it possible to optimise FNA procedures. Several publications have demonstrated that when pathologists take on interventionist roles, better results are obtained.

**Objective:** To demonstrate that a correctly trained pathologist is capable of carrying out ultrasound-guided FNA on a lymphatic node, while achieving the highest diagnostic efficiency.

**Method:** Ultrasound-guided FNAs on lymphatic nodes carried out by pathologists between April 2017 and January 2018 were quantified. Clinical data was recorded for age and sex of the patient, as well as the location and size of the lesion. The obtained samples were classified according to cytological diagnosis.

**Results:** Throughout the mentioned period, 95 ultrasound-guided FNAs on lymphatic nodes were performed. The average age of the patients was 55 and the average adenopathy size was 19 mm (ranging from 4 to 55). In 94.74% of cases the taken sample was sufficient for a diagnosis. In 25 cases (26.32%) metastasis at a nodular level was detected. Only in 9% of the cases was there suspicion of lymphoproliferative syndrome.

**Conclusions:** The results demonstrate high diagnosis efficiency when pathologists perform the Ultrasound guided FNA, followed immediately by the Rapid On Site Evaluation (ROSE). The percentage of samples deemed insufficient in such cases was very low (5%), and were associated with lesions of a very small size or which were necrotic. In the cases where a core needle biopsy or an excisional biopsy was necessary, the diagnosis coincided with that of the FNA. The systematization of the procedure has made it possible to optimize the timing, response and resources, in addition to minimizing its complications.

## P3-7 | Virchow's Node: Does the Concept Hold True Today?

M. J. Fernández Aceñero[1,2]; S. Merino Menéndez[1]; C. Díaz del Arco[1,2]

*[1]Clínico San Carlos Hospital, Madrid, Spain; [2]Complutense University of Madrid, Spain*

**Objectives:** Gastric carcinomas have been classically considered a frequent origin of left supraclavicular lymph node (SLN) metastasis. This clinical scenario has been called Virchow's node, as it is still mentioned in most Pathology textbooks. The aim of the present study is to see whether Virchow's node still has the same implications in the 21st century.

**Methods:** We have reviewed all fine needle aspiration cytologies (FNAC) of SLN diagnosed between 2010–2017 in our institution, and we have included all malignant (metastatic) cases. We have searched the electronic medical record files from the patients and collected age, gender and origin of the primary. Besides, we have analyzed what complementary tests were performed on cytological material.

**Results:** We have found 57 cases, in 39 of which no primary was previously known. Of these 39 cases, 17 were located in left SLN, 20 in right SLN and 2 were bilateral metastasis. As for the origin of the primary, all right and bilateral SLN metastasis were mainly originated in lung neoplasms, while left SLN were more widely distributed between lung (8 cases), prostate gland, breast and gastroesophageal junction (2 cases each) and tonsil and ureter (1 case each). Only one case was considered of unknown origin after thorough evaluation. When analyzing the 17 cases with a previously known primary, only 1 case was of gastric origin.

**Conclusions:** Our results show that gastric neoplasms are only rarely origin of left SLN metastasis and lung should be considered first in both right and left lesions.

## P3-8 | Cytologic Diagnosis of Non-Hodgkin Lymphoma in TBNA Aspirates

E. Mpota; Ch. Psachoulia; M. Kardari; Z. Stamou; P. Ravazoula

*University Hospital of Patras, Patras, Greece*

**Objective:** TBNA is a safe and minimally invasive recently developed technique method for diagnosis and staging of lung malignancy as well as the diagnosis of diseases affecting lymph nodes. We present a case of lymphoma and accentuate the role of TBNA in its diagnosis.

**Methods:** A 41 year HIV old man was admitted in the hospital because of a fever caught and loss of weight. During systematic examination and after a CT scan a well defined lesion was founded in the mediastinum. Subsequently the TBNA was followed and the

lesion was aspirated. The cytologic conventional smear and the liquid based specimens (Thin-Prep) were stained with Hematoxylin-Eosin and May-Grunwald Giemsa stains.

**Results:** The cytologic smears of the TBNA was cellular and showed the presence of monomorphous population of medium to large size cells with irregular nuclear membrane, fine nuclear chromatin, inconspicuous nucleoli and scant cytoplasm.

The tumor cells were positively stained for LCA, L26 and CEA, while they are negative for CD56,Synaptophysin,CD3,TTF-1,NSE,κ/λ, Bcl-2,Bcl-6. The cytologic diagnosis was consistent with a B-NHL large cell type.

**Conclusions:** In conclusion, TBNA is an accurate and safe procedure for diagnosis madiastinal lymphadenopathy.

## P3-9 | Metastasic Seminoma: An Unexpected Diagnosis in a Lymph Node Cytology

L. Maestro-Gomez[1]; I. Guerra Merino[1,2]; I. Gorostiaga Altuna[1]; L. Lorente-Gea[1]; N. Barriobero Alonso[1]; A. Perez-Rodriguez[1]; E. Pereda Martinez[1]

*[1]Hospital Universitario Araba, Vitoria, Spain; [2]University of Basque Country, Vitoria, Spain*

**Objectives:** To confirm the value of cytology to diagnose metastasic tumors of unknown origin in lymph nodes.

**Methods:** An ultrasound guided fine needle aspiration (FNA) was performed to a retroperitoneal mass. After the cytologic study, an inmunohistochemical panel was performed; PLAP, CD 117 and D2-40 were positive, CK AE1/AE3 was focally positive and CK 7 and CK 20 were negative.

**Results:** The cytologic smear displays discohesive large tumor cells dispersed in singles with clear cytoplasm, enlarged nucleus and many with prominent nucleoli, intermingled with epithelioid cells forming non-necrotizing granulomatous structures. The background shows variable amounts of lymphocytes. A citologic diagnosis compatible with metastasic seminoma was established.

**Conclusions:** The cytologic study of samples obtained by ultrasound guided FNA from lymph nodes and a correct inmunohistochemical profile can establish the diagnosis of metastasic tumours of unknown origin, even without the guidance of clinical history; a cell block from an aspirate may be critical for correct diagnosis.

Cytology is a useful diagnostic tool in tumors located in lymph nodes and less accessible masses, enabling to reach the diagnosis without a biopsy.

## P3-10 | Primary Pancreatic Lymphoma Diagnosed By Ultrasound Guided Fine Needle Aspiration Cytology, Flowcytometry and Immunohistochemistry: Analysis of 12 Cases

R. N. Rao[1]; R. Kashyap[2]

*[1]Pathology of Department, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, UP, India; [2]Department of Clinical Haematology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India*

**Background:** Primary pancreatic lymphomas (PPL) are extremely rare neoplasm. Radiologicaly, PPL usually situated in the region of head of pancreas. An accurate cytopathologic diagnosis by USG guided fine-needle aspiration (FNA) is indispensable, because the primary treatment is nonsurgical, based on a combination of chemotherapy and radiation therapy. Flowcytometry (FC) has significantly enhanced the correct diagnosis of PPL.

**Aims and Objectives:** To evaluate the pancreatic lymphoma by Guided cytology, ICC and FC.

**Materials and Methods:** Twelve cases of PPL were identified from the cytology division of pathology department over a 5 year period (2006–2010). All cases were diagnosed on USG FNA performed under radiologic guidance and some EUS-FNA.The smears were air-dried stained with May Grunwald Giemsa (MGG) and wet-fixed stained with the Papanicolaou stain or hematoxylin & eosin

**Results:** It includes 9 male and 3 female, age ranged from 15–75 years (mean age,55 years).The tumors varied in size from 2–14 cm, as evaluated on the radiologic scans (mean dimension of 8.0 cm).Abdominal pain was the most common presenting symptom (six patients) followed by jaundice, acute pancreatitis, small bowel obstruction and diarrhea.The cytomorphologic features included hypercellularity with dyscohesive cells with round irregular nuclei, prominent nucleoli, mitoses, and karyorrhexis.FC analysis was done in 10/12 cases demonstrated a monoclonal pattern of immunoglobulin light chain expression.The patients were treated with either chemotherapy alone or in conjunction with radiation therapy or stem cell transplantation.

**Conclusions:** PPL is a very rare neoplastic entity.USG-FNA with FC analysis appears to be highly accurate in the diagnosis of PPL and is the sole diagnostic modality used clinically. Based on cytomorphology, the main differential diagnoses of PPL involve secondary lymphoma, pancreatic endocrine neoplasm and florid chronic pancreatitis. An accurate USG guided FNA diagnosis of PPL is critical for timely, nonsurgical management and obviates the need for an exploratory laparotomy.

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flowcytometry and immunocytochemistry in the diagnosis of lymphoma. *Gastrointest Endosc*. 2001;53:485–491.

## P3-11 | Metastatic Cervical Lymphadenopathy: Fnac on the Fugitives Trail

P. K. Selhi; K. Mittal; H. Puri; N. Sood
*Dayanand Medical College Hospital, Ludhiana, Punjab, India*

**Objectives:** Metastatic cervical lymphadenopathy represents metastases not only from the head and neck primary tumours but also from remote, usually infraclavicular sites with or without an obvious primary tumour. This study was designed to identify morphological pattern of metastasis and distribution of primary tumour sites in cervical metastatic disease for prompt diagnosis and prognostication.

**Material and Methods:** A total of 55 patients diagnosed on FNAC as metastatic disease of cervical lymph nodes with unknown primary sites over 18 months were investigated and analysed in detail with reference to the epidemiology, pattern of lymph node involvement, morphological diagnosis and primary tumour site.

**Results:** During this 18 months' prospective study, 1,023 swellings in the neck region underwent FNAC. 37% (n = 382) were lymph nodes, of these, 23.9% (n = 91) were neoplastic with metastatic deposits being the most frequent accounting for 60.6% (n = 55) of the neoplastic cases. Maximum patients of cervical lymph node metastatic disease were in the 50–70 years' age group with a mean age of 59.11 years and showed male predominance. Adenocarcinoma was the most commonly encountered (63.8%) followed by squamous cell carcinoma. Carcinoma Lung was the frequent primary site followed by liver, thyroid, gall bladder & ovary.

**Conclusions:** FNAC is an important staging and diagnostic tool with an advantage of being cost-effective and minimally invasive rendering rapid diagnosis with negligible complications. However, due to limited diagnostic material, biopsy may sometimes be obligatory for molecular testing that may predict the likely benefit of treatment with targeted therapies.

## P3-12 | All Granulomatous Lymphadenopathies are Not Tuberculous on FNAC

U. S. Dinesh; A. Adidthya
*SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India*

**Introduction:** Granulomatous reactions in the lymph nodes are common and due to infectious agents or certain non neoplastic situations and occasionally also in neoplasms both primary and metastatic. However a clinician when seeing a cytologists report of granulomatous -what rings a bell is of tuberculosis. Fine Needle Aspiration Cytology (FNAC) is a very important diagnostic modality in the management of lymphadenopathy, which majority of times is tuberculous but unusual non tuberculous lesions are all encountered though rarely, of which a few encountered in hospital is discussed.

**Objectives:** To discuss and describe non tuberculous and unusual granulomatous lesions of lymph nodes encountered in our rural hospital on FNAC and confirmed on histopathology.

**Materials and Methods:** All FNACs of lymph nodes performed in our hospital over a five year period in which the histopathological exam was available were studied. Their case histories were noted. Of these unusual cases which presented with non tuberculous granulomatous cytological features were chosen and confirmed on histomorphological features of the excision biopsy. Special stains like Ziehl–Neelsen stain for Acid Fast Bacilli, PAS for fungi, and IHC in occasional cases of metastasis were studied.

**Results:** The unusual cases that we came across were atypical mycobacterial infections, sarcoidosis, NonHodgkin's Lymphomas, metastatic carcinomas, Eosinophilic abscesses and other conditions.

**Conclusions:** Granulomatous change of lymph nodes is common and is usually thought as tuberculosis especially in a country in India where it is quite common and is now re-emerging. However all are not so and many times unusual lesions such as atypical mycobacterium, non Hodgkins Lymphoma, Kikuchis and other conditions may present with this picture. Hence one should be aware and not dub all as tuberculosis and keep in mind the presence of such conditions.

## P3-13 | Profitability of Fine Needle Aspiration in the Diagnosis of Adenopathies in Emergency

P. Callejo; D. González; D. Colinas; V. Reyes; P. I. González; E. Pérez; J. M. Pigazo; M. C. González; T. Zamora; B. Madrigal; M. A. Torres Nieto; I. García Rupérez
*Hospital Universitario Río Hortega, Valladolid, Valladolid, Spain*

Lymphadenopathy is a common consultation in emergency. Most are secondary to banal infectious diseases, but it is important to recognize the characteristics of malignancy.

**Objective:** To analyze the characteristics of patients diagnosed with lymphadenopathy in a Hospital Emergency Service (HES) and the most frequent causes.

**Methods:** Retrospective descriptive study. Scope: Emergency hospital service.

Inclusion criteria: Patients aged ≥ 14 years, who came during 2014–2015 to the Emergency hospital service at the Hospital Universitario Río Hortega (Valladolid, Spain) with lymphadenopathy.

**Results:** N:100; Female (F):53%; Middle Ages (years:y): 34.2 years (14.5sd); Age/Gender (A/G):

14–40 years:76%,41–65 years:21%, >65 years:3%; Middle (A/G): Male(M):32.17(12.91 sd) F:36(15.71 sd), $p > 0.05$. Anatomical Regions: Head&Neck (HN)63%, Thorax&Axilla (TAX)15%, Inguinal(I) 22%;Fullfill Fine-Needle Aspiration (FNA)criteria:16%; (FNA)

requested:15% Realized: 13%; Diag:9%→Reactive (R):92%,Benign Tumour (BT):5%,Malignancy (M): 3%.Analysis AG/Anatomical Region:14–40 y→ HN: 60.5%, TAX: 14.5%, Inguinal: 25%; 41–65 y→HN: 81% TAX: 9.5%: Inguinal:9.5%; >65 y→HN: 0% TAX: 13.3% Inguinal: 4.5% p> 0.05. FNA requested/Gender: M:17%, F:13.2% p> 0.05. FNA requested/AG, 14–40 y:Yes 14.5%; 41–65 y:19%; >65 y:0% p > 0.05.FNA requested/Anatomical Reg: HN: Yes 14.3%; TAX: 20%; Inguinal:13.6% p > 0.05. Final diagnosis/gender: M→ R:91.5%, BT:4.3% MT:4.3%; F→R:92.5% BT:5.7% MT:1.9% p > 0.05. Age group/final diagnosis:14–40 y→ R:94.7%, BT:3.9%, M:1.3%; 41–65 y→ R:85.7%, BT:9.5%, M:4.8%; >65→ R:66.7%, BT:0%, M 33.3% p > 0.05. FNA requested / Diag: R:Yes 60%; B:33.3%; M: 6.7%.

**Conclusion:** The adenopathies are more frequent in women between 14 and 40 years old and appear mainly in HN. The most frequent diagnosis are benign processes [Benign 12 (80%), Malignant 2 (13%) and Insufficient 2 (7%)]. There are no significant differences between requesting FNA by age, gender or anatomical region. Of the FNA requested from the Hospital Emergency Service, the 80% had a final diagnosis. The FNAs is an useful and fast tool in the management of lymphadenopathy in the emergency consultations. Biopsy should carry out in cases of insufficient or suspicious of malignancy.

## P3-14 | Accuracy of Touch Preparation Cytology and Frozen Section For Intraoperative Diagnosis Of Sentinal Lymph Node Metastases In Breast Cancer

S. Naz; A. Hashmi; N. Faridi
*Liaquat National Hospital & Medical College, Karachi, Pakistan*

**Introduction:** Accurate analysis of Touch Preparation (TP) Cytology for intraoperative diagnosis of sentinel lymph node (SLN) Metastases can avoid unnecessary axillary lymph node dissection.

Frozen Section is the most popular method for intraoperative SLN diagnosis. Touch preparation Cytology has also been suggested as less expensive and rapid diagnostic tool. Moreover it provides clear cytologic details and allows examination of multiple cut surfaces at one time and preserving the tissue for permanent paraffin sectioning.

**Objective:** The aim of this study is to compare the accuracy of Touch Preparation Cytology and Frozen Section for the intraoperative diagnosis of Sentinal Lymph node Metastases in breast cancer.

**Material and Methods:** A prospective study is performed during September 2016 – May 2017 in Department of Histopathology and Cytology, Liaquat National Hospital and Medical College Karachi. 114 patients were included who underwent Sentinel LN dissection. All SLNs were sectioned at 2 mm intervals. TP were made from all cut surfaces after which all sections were examined for Frozen sections. Results of both Touch Preparation Cytology and Frozen Section were compared with final paraffin diagnosis.

**Results:** In a total of 114 patients, the mean age was 53 years, age range (25–83) and the mean size of SLN was 0.4 cm, size range (0–4) cm. The sensitivity, specificity and accuracy were 83.7%, 98.5% and 92.1%, respectively, for TP and 93.9%, 100% and 97.3% for FS. P-Value ≤0.05 considered as significant.

**Conlusion:** Intraoperative Touch Preparation Cytology is a useful method for evaluating axillary lymph node metastases in patients with breast cancer. Touch preparation cytology is marginally less sensitive but it is more cost effective and rapid diagnostic method than Frozen Section diagnosis. Hence, Touch Preparation Cytology can be used as alternative where frozen section facility is not available.

## P3-15 | Cat Scratch Disease in Lymph Node FNA

J. Moreno; A. Nieto; A. Gené
*Hospital Comarcal de Inca, Inca, Mallorca, Spain*

**Objectives:** We present a case of Cat Scratch Disease in a 50-year-old male with a history of fever, of unknown origin enlarged lymph node, exposure to a cat, and recent tattoos.

**Methods:** Inguinal adenopathy FNAP is requested. We performed 2 punctures of a 4 cm right inguinal lymph node. In relation to it, other adenopathies were palpated in deeper planes (approximately 4, with diameters between 1 to 3 cm.)

Cytology smears showed atypical polimorphous cells, some of a large size with a plasmocitoid appearance and scatered mitosis. Abundant black pigment too, probably due to tattoo in the same leg. Inmunohistochemical techniques to rule out other diagnoses such as metastases from carcinomas or melanomas were performed.

With the suspicion of a lymphoproliferative process an excisional biopsy is recommended for a correct pathologic diagnosis.

A left adenopathy of 2.5 cm was received. On its section, we identified a 2 cm black area, and oposite to it multiples areas of microabscesses that occupy both the cortical and medullary zones.

Histologically theses abscesses had a pattern of central, sometimes stellate necrosis with neutrophils, surrounded by a palisading of histiocytes. The sparse areas showed a follicular hyperplasia and sinuses were packed by monocytoid B cells. Theses abscesses are very suggestive of CSD.

The zone of black coloration corresponds to the presence of pigment within macrophages that are arranged occupying the sinusoids and the subcapsular sinus. Immunohistochemistry techniques showed: intense CD15, CD68 stain. In the areas of necrosis, with the Warthin Starry silver stain pleomorfic extracellular bacteruim were identified. Pas and Ziehl Neelsen were negative.

While the patient remained hospitalized, a possitive serology test for Bartonella was obtained.

**Results:** The final diagnosis was bacterial lymphadenitis with microabscesses sugestive of CSD and pigment deposition secondary to tattoo.

**Conclusions:** Cat Scratch Disease is a common disease that is rarely diagnosed in pathology, accounting 25,000 cases/ year in USA.

## P4 HEAD AND NECK CYTOLOGY (EXCLUDING THYROID)

### P4-1 | Demodex SPP as a Possible Cause of Discrepancies in Cytological and Clinical Findings in Patients with Suspected Basal Cell Carcinoma

S. Kuleshova; L. Minushkina

*Polyclinic, Department of Presidential Affairs of the Russian Federation, Moscow, Russia*

**Introduction:** Cytological material for suspected skin cancer was examined. Clinically symptoms of examined lesions differed, some included inflammation, or reactive cellular changes. The study aims to analyze the causes of discrepancies between the cytological and clinical findings in patients with suspected basal cell carcinoma of the skin (BCC).

**Patients and Methods:** Cytological analysis was carried out on a binocular microscope AXIOLAB (Austria). The material was stained with MGG. Cytological findings were formulated according to WHO histological classification of keratinocytic skin tumors. 84 studies were conducted for 71 patients aged 18 to 92 years.

**Results:** Of the 84 scrapings and skin prints, BCC was diagnosed in 57 cases (68%). In 4 cases diagnosis of squamous cell carcinoma was established. In one case basal squamous cell carcinoma was established. In two cases, the material was found to be insufficient for a cytological conclusion. 21 studies (25% of cases) showed no signs of keratinocyte tumors (n = 21). The histological examinations confirmed the cytological findings about the BCC in all cases. Of the 4 cases of suspected squamous cell carcinoma, the malignant nature of the epithelial tumor was confirmed. The squamous cell differentiation of BCC by histologists was not confirmed. In 21 cases when cytological signs of epidermal tumors were absent, all patients were referred by clinicians with suspicions of BCC. In 14 cases out of 21, the Demodex mite (66%) was found in a cytological study. The frequency of detection of Demodex spp in skin scrapings with suspected BCC suggests that in some cases, skin changes caused by persistent Demodex spp mite can simulate BCC.

**Conclusions:** Demodecosis and BCC have similar clinical skin manifestation due to multiple of BCC variants, insolated skin sites, older age of patients and skin erosions. Dermoscopy should be used to differentiate.

### P4-2 | Possible Spontaneous Autoinfarction of the Acinic Cell Carcinoma, Leading To False Negative Cytology

M. Bundele; C. Chau; B. Ho

*Tan Tock Seng Hospital, Singapore*

**Objectives:** Review of cytological features in an unusual case, resulting in a false negative diagnosis on cytology.

**Methods:** A 59 year old Indian female, non-smoker presented to the ENT outpatients department with a slow growing left facial swelling over a period of 2 years. On examination, a firm left parotid lump was noted with no palpable cervical lymphadenopathy. A CT scan of salivary gland and neck region showed a cystic rim enhancing 2.2 cm nodule in the superficial lobe of left parotid gland with the central portion showing nonenhancing high density fluid. FNAC of left parotid gland was done and was reported as Warthin tumour. Patient underwent elective left superficial parotidectomy about 2 months later. Frozen section showed a lesion with clear cell and oncocytoid morphology and definitive diagnosis was deferred to paraffin.

Histology showed 1.0 cm acinic cell carcinoma with only peripheral rim of viable organoid nests, resembling acinic cells. These cells showed Diastase resistant PAS positive granules and complete membranous plus cytoplasmic positive immunostaining with DOG1. S100, mammaglobin and p63 were negative. Majority central portion showed sheets of CD163 positive, AE1/3 and DOG1 negative histiocytes forming xanthogranulomatous reaction, with scattered lymphoid aggregates and plasma cells. The most central portion showed collapsed cavity with adjacent FNAC associated changes including haemosiderophages.

**Results:** Review of cytology showed highly cellular smears with dispersed cells, majority of which showed a loss of cytoplasmic borders with scattered clusters showing oncocytoid appearance and some background lymphocytes. Possible spontaneous autoinfarction led to this cytologic appearance, with cellular lytic material misinterpreted as background debris with interspersed lymphocytes and histiocytes infiltrates, features seen in Warthin tumour. On review, these dispersed nuclei resembled the nuclei of oncocytoid cells.

**Conclusions:** Spontaneous autoinfarction of acinic cell carcinoma can lead to misinterpretation of cytologic findings as Warthin tumour.

### P4-3 | Granular Cell Tumor in the Parotid: Diagnosing a Rare Tumor in an Uncommon Site by Fine Needle Aspiration Cytology

S. Afraz; N. Denic; C. Ghosh

*Memorial University of Newfoundland, St. John's, Newfoundland and Labrador, Canada*

Granular cell tumor (GCT) is relatively uncommon lesion which can arise in different anatomical locations. Since its first description in 1,854, origin of GCT has been attributed to several cell lineages from Schwann cells to most recently endomesenchymal cells of origin. [1,2] Although head and neck area is a common site, GCT is uncommonly reported in the parotid gland.

Here we report a case of parotid gland GCT diagnosed by fine needle aspiration (FNA) cytology followed by surgical excision.

A 56 year old lady presented with a painless lump in her left angle of mandible without facial nerve involvement. Ultrasound examination revealed a parotid gland based hypoechoic lobulated mass measuring 0.6 x 0.9 x 1.0 cm without significant vascularity on Doppler evaluation. Radiologic differential diagnoses include Warthin tumor, pleomorphic adenoma and low grade mucoepidermoid carcinoma.

FNA material processed by SurePath method shows groups of polygonal cells with abundant finely granular cytoplasm and eccentric small nuclei. Nuclear atypia, mitoses or necrosis are not seen. Immunocytochemistry done on FNA reveals negative Pankeratin and positive S100, CD68 and Neuron Specific Enolase staining. This immunopattern supports the morphologic impression of GCT. The patient underwent surgical excision. Histopathology and immunhistochemistry correlate with cytology diagnosis.

Diagnosis of parotid gland GCT in cytology sample is challenging given the rarity of the lesion. Only 2 case reports of the same have been published. [3,4] Cells with abundant granular cytoplasm are encountered commonly in parotid neoplasms like Warthin tumor, oncocytoma and acinic cell carcinoma. Pleomorphic adenoma and mucoepidermoid carcinoma can also show focal oncocytic changes. Less common entities of rhabdomyoma and sebaceous adenoma may come into differential diagnosis. Judicious use of immunohistochemical stains can guide to the correct diagnosis. FNA proves to be invaluable in diagnosing this rare tumor in an uncommon location and thereby, in appropriate patient management.

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## P4-4 | Fine Needle Aspiration Biopsy Of "Mammary Analogue Secretory Carcinoma": A Case Report Of Recently Described Neoplasm Of Salivary Gland

İ. Ş. İşgör; F. Gerin; N. Enver; R. Asadov; L. Cinel
*Marmara University, School of Medicine, Turkey*

Mammary Analogue Secretory Carcinoma (MASC) is recently described by Skalova et al in 2010. MASC has morphologic, genetic, and immunohistochemical characteristics similar to those of secretory breast carcinoma. MASC usually occurs in the parotid gland and can easily be misdiagnosed for acinic cell carcinoma or adenocarcinoma not otherwise specified.

We present a case of a twenty-five year-old male who complained for a swelling and pain in left *parotid gland region*. The ultrasonography (USG) guided fine needle aspiration (FNA) was performed on $2\times1$ *cm mass. There were* described as isolated cells as well as loosely cohesive clusters making papillary configuration and some of them making follicular like structures with secreted materials. On the background, many histiocytes and mucinous material were existed. Tumor cells were small to medium-sized oval or round shape and predominantly eccentric nucleus with prominent nucleoli, remarkably vacuolated cytoplasm. Intracytoplasmic zymogen granules were not realized. It was reported as a carcinoma with a differential diagnosis including acinic cell carcinoma, and adenocarcinoma NOS, among others .The patient underwent surgery, and the fully resected mass was sent for histopathological examination. Macroscopically, a solid mass, $2.2 \times 1.2 \times 1.1$ cm diameter, grey-tan color, with hemorrhagic areas were seen. Microscopically, tumour was well circumscribed with a hyalinised thick capsule and also lymphocytic inflammatory infiltrate was present in the capsule. Microcystic and macrocystic growth filled with eosinophilic material was seen. The papillary structures were lined by cells with hobnail like cells with eosinophilic to vacuolated cytoplasm. *Immunohistochemical results are negative* for p63, DOG-1, CD117 and positive for SOX-10, S100 and mammoglobuline. Final diagnosis was Mammary Analogue Secretory Carcinoma (MASC). At 5 months postexcision, he had a recurrent mass.

The World Health Organization (WHO) is recently described, rare salivary gland tumor that relates the morphology and genetics of an equally rare malignancy of the breast secretory carcinoma (SC) as Mammary Analogue Secretory Carcinoma (MASC). Making a preoperative or intraoperative diagnosis of MASC is sometimes can be challenging but it is important to discern from its mimickers due to the distinct clinical outcomes.

## P4-5 | Fibrous Solitary Tumor: An Important Differential Diagnosis of Spindle Cell Lesions Of Parotid

J. Fraga; R. Almeida; H. Moreira; A. Lai; M. Pimentão; V. Almeida; C. Faria; G. Fernandes
*Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*

**Objectives:** Fine-needle aspiration (FNA) is a simple, fast, minimally invasive, and cost-effective procedure, used as an initial diagnostic tool for an initial diagnosis of epithelial salivary gland (SG) lesions. FNA of spindle cell lesions of the SG is a very challenging area of cytopathology. SG tumors with a predominant spindle cell pattern are rare, accounting for less than 3% of SG aspirates. The most common spindle cell lesions of the salivary gland are myoepithelial-predominant pleomorphic adenoma, myoepithelioma, and schwannoma.

**Methods:** We present a case of a 25 years-old man with previous left superficial parotidectomy due to suspected pleomorphic adenoma, with a pathological diagnosis of severe lipomatosis, currently with left facial swelling. Magnetic nuclear resonance revealed located inside the masseter muscle, an oval, well delimited, discretely heterogeneous, with an intermediate signal in T1 and slight hypersignal in T2, with 4.2 × 2.8 × 4.5 cm, without signs of invasion of adjacent structures.

**Results:** Cytological smear revealed a population of short or oval spindle monotonous cells, arranged in small aggregates or isolated, with scarce matrix, in absence of necrosis or mitosis. Cell-block allowed immunohistochemical study revealing nature of the cells: positivity to vimentin, CD34, CD99, Bcl2 and negativity to CKAE1/AE3, EMA, S100, smoth muscle actin and enabled diagnosis of benign mesenchymal neoplasm / low degree of malignancy with cytological and immunohistochemical profile compatible with solitary fibrous tumor (SFT), with posterior histological confirmation.

**Conclusions:** Differential diagnosis of spindle sell lesions from salivary glands include schwanoma, neurofibroma, solitary fibrous tumor, leiomyoma, spindle cell lipoma, synovial sarcoma, melanoma, nodular fasciitis and fibromatosis. SFT represents a wide spectrum of tumor types of mesenchymal origin that can affect virtually any region of the body. Immunohistochemistry of STAT6 is useful for the diagnosis of SFT, particularly confirming the 5–10% CD34-negative SFTs and excluding other CD34-positive mesenchymal tumors.

## P4-6 | The Value of Exfoliative Cytology in the Diagnosis of Oral Mucosal Lesions

S. Divani[1]; A. Vardouli[1]; G. Kalodimos[2]; A. Konstantinou[1]; P. Skoufogiannis[2]; P. Karagounis[3]
[1]*Department of Clinical Cytology;* [2]*Pathology Department;* [3]*Otorhinolaryngology Clinic*

**Objective:** Oral cytology may be important in the diagnosis of oral mucosal lesions especially related to tobacco or sexual habits that are potentially involved with High Risk HPV infection. In addition oral lesions may be clinical manifestations of systematic diseases.

The aim of this study was to evaluate the importance of exfoliative cytology in the diagnosis of various disorders.

**Materials and Methods:** We analyzed the cytological findings of 79 patients with oral ulcerative lesions. Most of the patients 58/79 (73.4%) referred pain or burning sensation at the site of the ulcer.The scrapings for cytological examination were taken with a cytobrush and a plastic spatula and the specimens were prepared according to the Thin Prep technique.

**Results:** 20/79 (25.3%) painful ulcers showed bacterial infection whereas in 7 cases (8.8%) herpes was revealed. Trauma was the cause of ulceration in 10 patients (12.6%) and mycosis was found in 21 cases (26.58%). Leucoplakia was diagnosed in 9 cases (11.4%) whereas squamous carcinoma was the cytological diagnosis for 6 (7.5%) persistent ulcers (High risk HPV infection was associated with 3 of them).

**Conclusion:** Although most mouth ulcers are caused by bacteria, fungi or viruses, oral cancer could be the diagnosis. Autoimmune diseases, chemical injuries, kidney failure, trauma, lichen planus, pemphigoid, Bechets disease, periodontal disease or drug reactions may present oral lesions.

CMV infection, wich is common in renal transplant recipients in rare cases affects the mouth causing ulcers.

Cytologic examination can provide a correct diagnosis that is important for a successful treatment in many cases. It can be valuable for detecting early malignant changes or cancer recurrence.

## P4-7 | Fine Needle Aspiration Cytology (FNAC) Diagnosis of a Paraganglioma as a Parapharyngeal Mass

C. Lobo; L. Leça; P. Monteiro
*Portuguese Institute of Oncology, Porto, Portugal*

**Objectives:** Extra-adrenal paragangliomas are rare tumours, arising from chromaffin cells in sympathetic and parasympathetic paraganglia. Parapharyngeal space (PPS) is a rare location for head and neck tumors. The paragangliomas occurring in head and neck comprise 3% of all paranganglioma and almost all are located in the PPS. Most follow a benign course, but nearly 20% of paragangliomas, or even higher, if associated with predisposing genetic mutations, are malignant.

**Methods:** A 76-year-old female, without relevant personal or family medical history, presented with a painless slowly growing and palpable right cervical swelling. The patient appealed to general doctor and was then referred to our institution.

**Results:** Outside our institution, a cervical ultrasound was performed, revealing "a nodular mass with 44 × 33 × 24 mm, inferior to parotid gland and posterior to submandibular gland, suggestive of a lymph node" and a FNAC of the mass showed "blood, lymphocytes

and isolated epithelial cells with granular eosinophilic cytoplasm and irregular nuclei, suspicious of malignancy (carcinoma metastasis?).

At our institution, a head CT-scan was performed, revealing "in submandibular topography, deep to sternocleidomastoid muscle and posterior to jugulocarotid vessels, a lobular, well defined and contrast enhanced lesion with 44 × 42 × 25 mm, suggestive of a lymph node". MIBG scintigraphy was positive with intense fixing in a right retromandibular lesion, with features suggestive of malignancy.

A FNAC of the palpable right cervical swelling was done, that was insufficient for diagnosis. A repeat ultrasound guided FNAC was performed showing "cytomorphological and immunocytochemistry features compatible with paraganglioma"

**Conclusions:** FNAC can be an easy, rapid, and effective method of diagnosing a parapharyngeal mass. In our case, imagiological investigation did not give any clue to the diagnosis. With the increasing use of FNAC in the diagnosis of head and neck masses it is inevitable that the cytologist will have to be well acquainted with the FNAC findings of paragangliomas.

## P4-8 | Rare Head and Neck Metastases From Remote Primary Tumours: Fine Needle Aspiration Diagnosis Of Four Cases

L. López-Solache; A. Reguera-Arias; I. Galed-Placed; A. Concha-López

*Complejo Hospitalario Universitario de A Coruña, Spain*

Although most head and neck (H&N) metastases arise from primary local tumours, metastases from non-H&N neoplasm should be considered, even more when an infraclavicular primary tumour is known. The most common remote primary tumours associated with H&N metastases include cancers of the breast, lung, kidney, cervix, and testis.

Despite H&N metastases from a remote primary site represent advanced-stage disease, there are situations in which meaningful survival and quality of life can be achieved with appropriate local treatment.

Fine needle aspiration cytology (FNAC) is an accurate, safe, and minimally invasive technique and it can be extremely helpful, not only in their surgical planning but also in the general clinical management of these patients.

We present four examples of H&N metastases from distant primary tumours diagnosed by FNAC. A testicular seminoma metastatizing in a cervical lymph node, a multiple scalp subcutaneous metastases from a primary breast cancer, a cholangiocarcinoma metastatizing in the larynx and the parietal bone metatastases of an hepatocellular carcinoma are exposed. Their clinical, cytopathologic and immunocytochemistry features are described and the role played by FNAC in these instances is stressed.

## P4-9 | Spindle Cell Lipoma With Extensive Myxoid Matrix in the Parotis Gland. A Case Report and Differential Diagnosis on Fine Needle Aspiration Biopsy

L. Cinel[1]; İ. Ş. İşgör[1]; H. Sahin[1]; R. Asadov[1]; A. C. Yumuşakhuylu[1]

[1]*Marmara University, School of Medicine*

Lipoma and sialolipoma constitute up to 0.5% of salivary gland tumours. Spindle cell lipoma, a variant of ordinary lipoma, is extremely rare. It is usually slow-growing and clinically asymptomatic in male patients of middle to older age.

We report a case of 52-year-old man who complained swelling on left preauricular region for one year. He suffered a head injury 6 years ago and he had posttraumatic grade 2 facial paralysis and strabismus. For this reason it was applied to decompression surgery. The ultrasonography (USG) guided fine needle aspiration (FNA) was performed on 2 × 2 *cm mass. The cytologic smears showed bland appearing spindle cells, adipocytes, ropy collagen fibres and mast cells in a prominent myxoid backround.* It was reported as suspicious for neoplasia with a differential diagnosis including pleomorphic adenoma, atrophic salivary gland parenchyma, myoepithelioma with lipomatous metaplasia, neurilemmoma, myxoma, myxoid liposarcoma and lipomas. The patient underwent surgery, it was signed out as spindle cell lipoma. Cytopathologists must be aware of the cytomorphologic features of this entity not to make a false diagnosis.

## P4-10 | Metastatic Malignant Melanoma Of The Parotid Gland Identified By Needle Aspiration Test

F. L. Alarcón[1]; C. L. Varela[1]

[1]*Hospital General Universitario Gregorio Marañón*

**Introduction and objectives:** Malignant Melanoma (MM) is an aggressive neoplasm associated with poor prognosis, especially at advanced stages, it's derived from the skin melanocytes or from the melanin cells in the basal mucosa, which corresponds to 1–3% of all human malignancies.

We report a case of a 75 year old woman, with MM scalp history that was removed on June 2015. After one year follow-up, the patient presents an occipital lymph node relapse, near the surgical wound, which was entirely removed. Two years later, the patient referred pain on the left parotid region. The ultrasound revealed a solid well defined nodule of 20 × 12 mm, compatible with Benign mixed tumor.

**Materials and Methods:** A fine needle aspiration (FNA) test, from left parotid nodule was performed to obtain material and it was included to make Diff Quik and immunohistochemical stains.

**Results:** Cytological examination showed hypercellular smears on an hematic background, constituted by atypical plasmocytoid cells, arranged in plates, and single cell pattern, that showed abundant cytoplasm frequently pigmented, with pleomorphic variable size eccentrically-placed nuclei, that associated occasional prominent nucleoli and binucleation images. Immunohistochemical stains of neoplastic cells for HMB-45 and S100 were positive, that confirmed the metastatic process.

**Conclusions:** The parotid glands are an unusual site for metastases, however sometimes the glands and its associated lymph nodes can be involved by metastases from head/neck carcinomas and MM. Metastatic MM of the parotid represents 8–15% of the head and neck melanomas, and less than 1% of the rest of the body melanomas. FNA is a rapid, accurate and minimally invasive procedure that can be helpful to evaluate cytomorphological features like cytoplasm pigment, binucleation and nucleoli image, which can guide to MM diagnosis.

Our case, is an example of unusual parotid metastatic MM, identified by FNA, after two years of the primary lesion, which allowed to identify MM cytomorphological characteristics.

## P4-11 | Salivary Duct Carcinoma: Is Diagnosis Possible by Fine Needle Aspiration Cytology?

H. Thanky[1]; N. Oza[2]; S. V. Kane[1]

[1]*Department of Cytopathology, Tata Memorial Hospital, Mumbai, India;* [2]*Mazumdar Shaw Medical Centre, Narayana Health City, Bangalore, India*

**Objectives:** Salivary duct carcinoma (SDC) is an aggressive epithelial malignancy of salivary gland that is usually diagnosed after surgery. Prompt pre-operative diagnosis is important for surgical planning and neoadjuvant targeted therapy. We attempted to evaluate role of cytomorphologic features in diagnosis of SDC and correlated with histology diagnosis and immuno-positivity for Androgen Receptor (AR).

**Material and Method:** Retrospective study of cases reported as SDC on histopathology during 5 years and its corresponding FNAC were reviewed. Cytomorphology analysed and immunostaining for AR was done on de-stained smear to corroborate diagnosis whenever possible.

**Results:** FNAC of 32 cases diagnosed as SDC were reviewed. M:F ratio being 4.7:1 and age range 37–76 years.

Possibility of Carcinoma-ex-Pleomorphic adenoma was noted in 19.

Parotid gland was the most common primary site (93%) followed by submandibular gland (7%). In 18% cases FNAC was for recurrent disease.

Primary tumour site was aspirated in 93% cases and in 7% lymph nodes were aspirated. Diagnosis of SDC was offered on 18 cases (56%), while diagnosis of high grade salivary glanfd carcinoma was given in 11 cases (34%) and non-diagnostic aspirate in 3 cases (10%)

Characteristic features of SDC noted were: highly cellular smears (90%), cells arranged in clusters (95%); large polygonal cells (80%), marked nuclear pleomorphism (65%) and prominent nucleoli (90%), abundant dense cytoplasm (90%); Background – dissociated cells (50%), necrosis (40%), mucin (6%). Mitosis were noted in occasional cases (10%). Positivity for AR immunostaining was present in 90% cases.

**Conclusion:** Diagnosis of SDC should be offered in presence of cellular smear showing markedly pleomorphic large polygonal cells with prominent nucleoli and abundant dense cytoplasm. This can be substantiated with AR immunostaining on smears.

However, with AR negativity, SDC shouldn't be excluded in high grade carcinoma of salivary gland. Possibility of the same should be conveyed to treating clinician.

## P4-12 | Primary Bilateral NHL of the Parotid Gland Primarily Diagnosed in Fine Needle Aspirates. A Case Report

A. Koliou; C. Psachoulia; M. Kardari; C. Mpota; M. Melachrinou

*University Hospital of Patras, Patras, Greece*

**Objectives:** Primary lymphomas of the parotid gland are an uncommon entity comprising only 0.5–5% of all parotid tumors. The majority of them are usually unilateral NHL B-cell type. In the present study, a case of primary, bilateral mantle NHL of the parotid gland primarily diagnosed by FNA cytology is presented.

**Methods:** A 70-year old man was referred to Department of the Otorhinolaryngology of the hospital complaining for a progressive, bilateral, painless swelling of parotid glands since six months ago. A fine needle aspiration (FNA) was bilaterally performed and conventional smears as well as liquid based specimens (Thin Prep) were taken. All the cytologic smears were stained with Papanicolaou and May-Grünwald Giemsa stains.

**Results:** The cytologic examination revealed the presence of a cellular, monomorphic, lymphoid population composed of small and intermediate sized cells with scant cytoplasm, nuclear membrane irregularities and indentations and fine nuclear chromatin distribution. Nucleoli were scarcely noticed. Positive immunocytochemistry for L26, CD5 and bcl2, as well as, negative expression for CD10, CD23 and cyclin D1 was detected. Based on the above findings, the cytologic diagnosis was consistent with NHL mantle lymphoma. The subsequent histolologic biopsy confirmed the cytologic report.

**Conclusions:** We wish to emphasize the role of fine aspiration cytology in the diagnosis of a bilateral mantle NHL of the parotid gland, when the morphologic findings with the immunocytochemical results are taking into account and its contribution to the patient's treatment.

## P4-13 | Important Differential Diagnosis of Spindle Cell Lesions Of Parotid: A Case Report Of Melanoma Metastatis

J. Fraga; R. Almeida; H. Moreira; A. Lai; M. Pimentão; V. Almeida; C. Faria; G. Fernandes
*Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal*

**Objectives:** Fine-needle aspiration (FNA) is a simple, fast, minimally invasive, and cost-effective procedure, used as an initial diagnostic tool for an initial diagnosis of epithelial salivary gland (SG) lesions. FNA of spindle cell lesions of the SG is a very challenging area of cytopathology. SG tumors with a predominant spindle cell pattern are rare, accounting for less than 3% of SG aspirates. The most common spindle cell lesions of the salivary gland are myoepithelial-predominant pleomorphic adenoma, myoepithelioma, and schwannoma.

**Methods:** We present a case of a 74 years-old man revealing multiple parotid and cervical nodules.

**Results:** Cytological examination revealed acinar clusters involved by densely cellular lesion, constituted by fusiform cells, isolated or arranged in little cohesive aggregates, with elongated nuclei, sometimes with visible nucleolus and nuclear pseudoinclusions, with moderate pleomorphism. Cell-block was performed and revealed cytoplasmatic positivity of these cells to vimentin, S100, HMB-45 and Melan-A. As conclusion cytomorphological and immunohistochemical aspects were compatible with metastasis of melanoma. Posterior evaluation of patient's background revealed an excision of pigmented lesion of left hemiface, not histologically evaluated.

**Conclusions:** Melanomas are a heterogeneous group of malignant tumors with many faces and metastization to parotid has been infrequently reported. Spindle cell melanoma may mimic other spindle cell lesions because the characteristic features of conventional melanoma may be lacking. General cytologic features suggestive of a malignant spindle cell tumor include hypercellularity, nuclear pleomorphism, hyperchromasia and irregular chromatin distribution, high mitotic index, atypical mitoses, prominent nucleoli, and background necrosis and hemorrhage. Cytological differential diagnosis of spindle cell lesions include nodular fasciitis, solitary fibrous tumor, myoepithelial carcinoma, spindle cell carcinoma and melanoma. This case reinforces the need of always considering metastatic lesions in the differential diagnosis of asymptomatic major salivary glands nodules, and the importance of careful search for clinical and imagiological information.

## P4-14 | Recategorization of Salivary Gland Fine Needle Aspiration Biopsies According To The Milan System And Comparation With Histopathologic Findings

İ. Ş. İşgör; S. Y. Erçetin; R. Asadov; L. Cinel
*Marmara University, School of Medicine*

**Background:** Salivary gland malignancies accounted for 2–4% of head and neck cancers. Fine needle aspiration cytology (FNAC) has been used in pre-operative diagnosis of salivary gland lesions. Although FNAC is a highly reliable technique for pre-operative diagnosis, there was no consensus about the reporting of salivary gland FNA. Recently, an International group of pathologists has recommended a classification system for reporting of salivary gland FNAC called the name "Milan System for Reporting Salivary Gland Cytopathology". In this study, we aimed to evaluate the usability of the Milan System and to compare histopathologic findings.

**Methods:** Retrospective analysis was performed for parotid and submandibular gland FNAs in our department from 2013 to 2017. There were revealed 404 FNACs. Of these, 67 cases had underwent surgery. The cytology samples of 67 cases were recategorized according to the Milan system as follows into six categories: 1- Nondiagnostic, 2- Nonneoplastic, 3- Atypia of Undetermined Significance (AUS), 4- a) Benign Neoplasm, b) Salivary Gland Neoplasm of Undetermined Malignant Potential (SUMP), 5- Suspicious for malignancy 6- Malignant. In addition that, the risk of malignancy and the risk of neoplasm were calculated for all categories.

**Results:** Seven (10.4%) of the cases were nondiagnostic. The diagnostic accuracy of nonneoplastic (3) cases is 100%. The risk of neoplasm was 66.6% (4/6) and the risk of malignancy was 0% in AUS group The diagnostic accuracy of benign neoplasia group (30) is 96%. In SUMP group (6), the risk of malignancy was 16% (1/6) and in the suspicious for malignancy group was 90% (9/10). In the malignant group (5), the diagnostic accuracy was 100%.

**Conclusion:** Salivary gland FNAC still have high diagnostic accuracy. Milan System will help to produce standart reporting and also clinical management.

## P4-15 | Review of Salivary Gland Cytology in a Tertiary Care Center With Categorization By Milan System

H. Sarin; R. Kaushik; D. Gautam; S. Kakkar; D. Sarin; K. K. Handa
*Medanta – the Medicity, Gurgaon, India*

**Objectives:** To evaluate the diagnostic accuracy of salivary gland FNA when categorized by the Milan system of reporting.

**Methods:** A review of salivary gland FNACs reported between December 2013 and June 2017 was done. Giemsa & Pap stained smears were blindly reviewed by 2 trained cytopathologists and categorized according to the Milan system of reporting. Histopathological correlation was done in cases wherever available. Risk of malignancy for each category was calculated and accuracy of the system was evaluated.

**Results:** Aspirates from a total of 242 salivary gland lesions were assessed. The cytodiagnosis were categorized into Non-diagnostic, Non-neoplastic, Atypia of undetermined significance, Benign

neoplasms, Salivary gland neoplasms of uncertain malignant potential (SUMP), Suspicious for malignancy and Malignant. Histopathologic correlation was available for 71 patients.

The risk of malignancy for each category was: Non-diagnostic 50%, Non-neoplastic (0%), AUS (14.3%), Benign Neoplasms (3.2%), SUMP (20%), Suspicious for malignancy (58.3%), Malignant (87.5%). The accuracy for differentiating malignant tumors from benign tumors was calculated.

**Conclusion:** FNAC is a reliable tool for diagnosing salivary gland lesions. The tiered, risk based Milan system of reporting is beneficial for guiding clinical management of patients and has acceptable accuracy. Its value is highlighted in cases where overlapping cytomorphologic features render a definitive diagnosis difficult. However larger population based studies would lend more insight into merits and demerits of the proposed system.

## P4-16 | The Milan System For Reporting Salivary Gland Cytology: A Tertiary Center Experience With 645 Cases

H. Wu
*Indiana University School of Medicine, Indianapolis, Indiana, USA*

**Objectives:** Fine-needle aspiration (FNA) biopsy is a well-established technique for preoperative evaluation of salivary gland lesions. The Milan System for Reporting Salivary Gland Cytology (MSRSGC) suggested a 7-tiered system for diagnostic classification: nondiagnostic (ND), non-neoplastic (NN), atypical of undetermined significance (AUS), benign neoplasm (BN), salivary gland neoplasm of uncertain malignant potential (SUMP), suspicious for malignancy (SM), and malignant. This study aimed to determine the reliability of the Milan System.

**Methods:** A pathology database search for FNA of salivary gland lesions reported on 2010–2017 was conducted. The final diagnosis of each case was reclassified based on MSRSGC, and histology follow-up (core biopsy or resection) of these cases was retrieved. The risk of malignancy of cases from each category was calculated.

**Results:** A total of 645 salivary gland aspirates was reclassified based on MSRSGC resulting in: ND 62 (9.6%), NN 185 (28.7%), AUS 27 (4.2%), BN 206 (31.9%), SUMP 43 (6.7%), SM 7 (1.1%), and Malignant 115 (17.8%). Histology follow-up was noted in 305 cases (47.3%) including 32 cores and 273 resections. The risk of malignancy for each category was: ND 16.7% (3/18), NN 7.9% (3/38), AUS 38% (8/21), BN 0.8% (1/120), SUMP 51.9% (27/43), SM 100% (4/4), and Malignant 98.7% (76/77). For statistic calculation, we excluded cases of ND, AUS, and SUMP. We included SM and malignant cases as positive and NN and BM cases as negative. The sensitivity, specificity, positive predictive rate and negative predictive rate were 95%, 99%, 99%, and 97% respectively.

**Conclusions:** MSRSG is useful for subclassification of the FNA diagnoses of the salivary gland lesions. Indeterminate diagnostic categories compose a small proportion of cases, 4.2% for AUS and 6.7% for SUMP. The risk of malignancy is intermediate at 38% for AUS and 51.9% for SUMP respectively.

## P4-17 | Central Giant Cell Granuloma of the Zygoma, Mimicking Malignancy on Fine Needle Aspiration Cytology

G.-E. Kim
*Chonnam National University Medical School, Gwangju, Korea*

**Background:** Central giant cell granuloma is a benign lesion predominantly found in the jaw, in particular the mandible of young females. Cytohistologic findings include osteoclast-type multinucleated giant cells and mononuclear stromal cells.

**Case:** A 51-year-old male presented with a right cheek painful hard mass for 15 days. Clinicoradiologic impression was malignant tumor of the zygomatic bone and fine needle aspiration (FNA) was performed. FNA smears revealed a hypercellular lesion with numerous multinucleated giant cells, sheets of atypical spindle-shaped and polygonal cells, and atypical mononuclear cells. FNA diagnosis was highly suspicious for high-grade malignancy. However, at mass removal, central giant cell granuloma was confirmed histologically. After three-year-follow-up, the patient remains free of recurrence or metastasis.

**Conclusions:** FNA cytology is well-established as an effective diagnostic method for the diagnosis of head and neck lesions. This report highlights that high cellularity and nuclear atypia of central giant cell lesion on FNA may mimic malignancy in the setting of consistent clinical and radiologic findings. Central giant cell granuloma should be considered in the differential diagnosis of FNA of the head and neck.

## P4-18 | Impact of FNAC in the Management of Salivary Gland Lesions

C. R. S. Dsouza; H. Fernandes; U. Pather
*Fr Muller Medical College*

**Introduction:** Salivary gland tumors are generally not subjected to incisional or core needle biopsy, because of the possible risks of fistula formation and tumor seedling. FNAC diagnosis of salivary gland neoplasms aids in proper planning of required surgery and avoidance of the same in cases of non-neoplastic lesions.

The purpose of this study was to determine the diagnostic value of FNAC in the surgical management of salivary gland lesions.

**Materials and Methods:** Data of all the patients who underwent FNAC for salivary gland lesions over a period of two years and the Histopathology diagnosis of the patients who had undergone surgery for the same were retrieved from the records of department of

pathology. The sensitivity, specificity and accuracy of FNA were calculated.

**Results:** During the study, a total of 3,269 FNAC's were performed out of which salivary gland FNAC's constituted 68 in number (2.08%).

The peak incidence of tumors was in the third to fourth decade, with the oldest patient being 77 year-old, with a slight male preponderance. The parotid was the most commonly affected gland. Pleomorphic adenoma and. Mucoepidemoid carcinoma was the commonest benign and malignant tumor respectively.

Thirty three patients had undergone surgery, either excision or definitive surgery depending on the FNAC diagnosis. One false positive cytological diagnosis was mad among 21 histologically diagnosed benign tumors with a diagnostic accuracy of 95.5%. However 2 cases of false negative cytological diagnosis were observed among malignant cases with 75% diagnostic accuracy. Only 4 among 13 the nonneoplastic lesions had undergone excision with 100% accuracy. Sensitvity and specificity of FNAC was 80% and 95.5% respectively. Mucoepidermoid carcinoma (low grade) was the only tumor incorrectly diagnosed which did not change the management drastically.

**Conclusion:** FNAC is a reliable diagnostic tool in surgical management of salivary gland lesions.

## P4-19 | Cytological Diagnosis of Lymphoepithelial-Like Carcinoma of the Parotid Gland

C. Rodríguez; J. E. Apaza; S. Y Moreno; M. García; S. González; M. A. Velasquez; F. Lozano; J. Rodríguez-Costa
*Hospital General Universitario Gregorio Marañón, Madrid, Spain*

**Objectives:** Lymphoepithelial-like carcinoma (LEC) of the parotid gland is a rare tumour with specific cytological characteristics that help differentiate it from other processes of similar characteristics (metastatic EBV-associated carcinoma, malignant lymphoma, lymphoepitelial sialadenitis, malignant melanoma and nonsebaceous lymphadenoma).

The incidence of this tumour is increased among Eskimos and Orientals, where it's usually associated with Epstein-Barr virus.

In Western countries, salivary gland LECs are uncommon and they are rarely associated with EVB.

**Materials:** A 54-year-old woman from Morocco with no relevant medical history, presented with a 2 cm tumour in the right parotid gland of 4 months evolution.

A Computerized Tomography (CT) scan was performed and showed a polylobulated and heterogeneous intraparotid mass that affected both superficial and deep lobes and the parotid tail.

A fine-needle aspiration (FNA) test was performed in order to classify the mass. Eventually a biopsy of the mass was performed.

In view of the FNA and the biopsy results, right parotidectomy and lymph node dissection was performed in the area of the previous biopsy.

**Results:** The FNA test showed carcinoma cells in cohesive aggregates or individual cells, with large, round and irregular nuclei and scarce cytoplasm. Fusiform cells were frecuently seen.

The biopsy of the tumour showed a salivary parenchyma surrounded and infiltrated by a proliferation of neoplastic cells forming solid nests separated by a lymphoid stroma, with sclerosis.

The study of the parotidectomy specimen confirmed the diagnosis of LEC of the right parotid gland with 6/8 lymph nodes affected by the tumor.

In situ hybridization for Epstein-Barr encoded RNA (EBER) virus was positive.

**Conclusions:** FNA is very useful technique in these type of tumors to obtain a previous diagnosis that will allow us to discard other pathologies with similar characteristics.

## P4-20 | The Importance of Mammaglobin in the Diagnosis of Mammary Analogue Secretory Carcinoma (MASC). A Case Report and Literature Review

M. Cerdán[1]; C. Iglesias[1]; M. Serra[1]; I. Munné-Bertran[1]; M. Alberola[1]; J. Temprana-Salvador[1]; S. Ramón y Cajal; C. Dinarès
*Vall Hebron University Hospital, Barcelona, Spain*

**Objectives:** To prove the importance of mammaglobin in the differential diagnosis of MASC in our case and literature review.

MASC, most common in the parotid gland, is generally a low grade salivary gland carcinoma characterized by sharing morphological, histological, immunohistochemistry with the secretory breast carcinoma. MASC displays a strong mammaglobin positivity and ETV6-NTRK3 gene fusion. The principal differential diagnosis must be made with acinic cell carcinoma (ACC).

Mammaglobin is one of the first relatively mammary-specific and mammary-sensitive markers. This glycoprotein is overexpressed in primary and metastatic breast cancer (85%) but also has shown to be expressed in non-breast cancer such as salivary gland carcinoma (20%) except for ACC.

**Methods:** 59 years old patient who presented small node in preauricular level. Fine needle aspiration (FNA) was performed.

**Results:** Cytology smears had hematic background and were hipercellular. There were many cohesive syncytial clusters, occasionally papillary, and isolated cells. The tumor cells showed small to medium size, granular eosinophilic vacuolated cytoplasm, oval nuclei and small nucleoli. These cells expressed mammaglobin positivity performed on the cytology slide.

Histologically the parotid gland displayed predominantly a mixture of follicular and papillary-cystic structures in a microcystic pattern. The immunohistochemical profile was estrogen and progesterone receptor, HER2 and C-kit negative; mammaglobin positivity and androgen receptor nuclear positivity only in 10–20% of tumor cells.

**Conclusions:** MASC diagnosis is important because before its description in 2010 it was mistakenly classified as ACC. Although mammaglobin is a useful marker in the differencial diagnosis between MASC and ACC, its positivity for other salivary gland tumors makes it less specific, so molecular techniques are recomended to confirm the diagnosis of MASC as detection of ETV6-NTRK3 gene fusion, that was confirmed in our case.

## P4-21 | Diagnostic Accuracy in Acinar Cell Carcinoma by Fine Needle Aspiration Cytology (FNAC). Can We Improve it Using Dog1 and Sox10 Immunohistochemistry? Institutional Experience

C. Vásquez-Dongo; D. Ladino; M. Hernández; C. Orensanz; E. López-Bonet; M. Turell

*Department of Pathology. Hospital Universitary de Girona Dr. Josep Trueta. Girona-Spain*

**Objectives:** Acinic Cell Carcinoma (AcCC) represents 17% of malignant salivary gland tumours. Fine Needle Aspiration Cytology (FNAC) is a preoperative diagnostic tool through cytological features, occasionally by immunohistochemical assessment (DOG1 and SOX10 described as markers of salivary acinar differentiation in AcCC).
The aim of this study is to assess salivary gland FNAC's accuracy for AcCC diagnosis in our institution and evaluate if immunohistochemical expression of DOG1 and SOX10 improve diagnostic accuracy.

**Methods:** We identified salivary-gland resections diagnosed as AcCC and random controls and compared their previous FNACs from 1992 to 2017. Sensitivity, specificity and accuracy were calculated. DOG1 and SOX10 expression in cell-blocks were evaluated.

**Results:** From 185 salivary resections in 25 years, 20 were AcCC: 15 had correlated pre-FNAC (4 suspicious and 8 positives AcCC; 1 for mucoepidermoid carcinoma, 1 suspicious for basal-adenoma vs adenoid-cystic carcinoma, 1 normal salivary gland); 1 without pre-FNAC and 2 pre-FNACs insufficient. 6 controls (4 FNAC-histologically concordant, 2 FNACs suspicious for AcCC with histological diagnoses as pleomorphic adenoma and cystadenoma). FNAC's sensitivity was 80%, Specificity:66%, Accuracy:76%.
Immunohistochemistry assessment: DOG1 positive expression in FNAC cell-block material was found in 13 cases (12 with AcCC histological diagnosis, 1 in non-AcCC). Negativity in 8 cases (3 AcCC; 5 non-AcCC). Sensitivity 80%; Specificity 83%. FNAC plus DOG1 immunohistochemistry improved sensitivity (93%), accuracy (81%) but no specificity (50%).
SOX10 positive expression was found only in 6 cases (4 AcCC; 2 non-AcCC). Negativity in 15 (11 AcCC; 4 non-AcCC). Sensitivity 27%; Specificity 67%; Accuracy 39%. FNAC (cytologically suspicious) plus SOX10 "improved" sensitivity at 86%, but decreased specificity (33%). Cytogically suspicious FNACs plus DOG1+ or SOX10+ increased sensibility (92%), decreasing specificity (17%).

**Conclusions:** Good FNAC's sensitivity and accuracy was found in AcCC diagnosis, mainly by cytological approach. Imnunohistochemical use of DOG1 can help, but SOX10 doesn't work out as a useful marker. FNAC+DOG1 showed high sensitivity with the possibility of using them together as a screening test.

## P4-22 | Fine Needle Aspiration Cytology Of Rare Salivary Gland Tumor: Mucoepidermoid Carcinoma Ex Pleomorphic Adenoma

J. Musayev; A. Hasanov; M. Baghirzade; Kh. Bakhshaliyeva

*Azerbaijan Medical University, Baku, Azerbaijan*

**Objectives:** Mucoepidermoid carcinoma ex pleomorphic adenoma (MCPA) is a rare tumor of salivary glands. Usual localisation is major salivary glands but rarely can be seen in minor salivary glands also. Preoperative cytological diagnosis of this rare entity is difficult and requires careful fine needle aspiration (FNA) procedure for correct diagnosis.

**Methods:** Preoperative cytopathological and postoperative histopathological findings of MCPA detected in the parotid gland of middle-aged female patient were analysed retrospectively.

**Results:** Middle-aged female patient admitted to the department of maxillofacial surgery with complaints of pain and recently rapid-growing mass in the left parotid region. FNA was performed by using 24-gauge needle and 10-ml syringe attached to the syringe-holder and three direct smears were prepared by the (cyto)pathologist. One smear was air-dried for May-Grünwald-Giemsa (MGG) staining while the other two was alcohol-fixed for Papanicolaou and Hematoxylin&Eosin stains. Abundant mucinous background, mucoid and epidermoid cell groups were seen in hypercellular smears. However, few epithelial/myoepithelial cell groups with metachromatically staining fibrillary stromal fragments were observed. FNA material was reported as malignant cytology, being compatible with low grade mucoepidermoid carcinoma, and the patient underwent total parotidectomy. The histopathological features revealed a mass with predominance of typical pleomorphic adenoma elements, and presence of mucoepidermoid carcinoma malignant epithelial cells with abundant extra- and intracellular mucin accumulation. The tumor was reported as low grade MCPA.

**Conclusions:** Carcinoma ex pleomorphic adenoma should be on the mental list of the (cyto)pathologist in differential diagnosis of suddenly fast-growing salivary gland masses. In cytological examination benign mucinous lesions such as pleomorphic adenoma with extensive mucinous differentiation should be excluded carefully.

## P4-23 | Metastatic Malignant Melanoma In Intraparotid Lymph Node: Report Of Three Cases With Cytology And Histology Correlation

B. Onal[1]; J. Musayev[2]; W. P. Walker[3]

[1]Ankara Diskapi Teaching and Research Hospital, Ankara, Turkey; [2]Azerbaijan Medical University, Baku, Azerbaijan; [3]Bronson Methodist Hospital, Kalamazoo, Michigan, USA

**Objectives:** Metastatic tumors of salivary glands are uncommon lesions. Melanoma is one of tumors which constituted the majority of secondary salivary gland malignancies. Preoperative cytological diagnosis of such lesions can present diagnostic challange.

**Methods:** Preoperative cytopathological and postoperative histopathological findings, as well as demographic data of patients were analysed retrospectively.

**Results:** Two patients were male (27 and 50 years-old), and one was female (54 years-old). All patients admitted to the clinic with painless and rapid-growing mass formation in the parotid region. Fine needle aspiration procedures were performed by the (cyto)-pathologists as a first- step diagnostic method with ultrasonographic examination. Characteristic blood-clot like material was collected by aspiration and direct smears were prepared. Smears were stained by May-Grünwald-Giemsa, Papanicolaou and Hematoxylin&Eosin. Single cells and three-dimentional cell groups with hyperchromatic and pleomorphic nuclei were seen throughout hypercellular smears. Nucleoli were observed in some cells. A small amount of pigment accumulations could be detected in retrospective analysis of smears. FNA material was reported as malignant cytology and total parotidectomy was done for all cases. The histopathological features revealed a metastatic malignant melanoma in intraparotid lymph node. The spindle cell phenotype was observed in one case (27/M). Extranodal extension and involvement of other lymph nodes were not observed in any of cases. Primary tumor was detected in head& neck region in all cases.

**Conclusions:** Metastatic tumors, as well as malignant melanoma should be on the mental list of the (cyto)pathologist for differential diagnosis of radiologically well-circumscribed, fast-growing salivary gland masses. Observation of blood-clot like material during aspiration and carefully looking for pigment accumulations in smears could be helpful for correct diagnosis in preoperative cytological examination.

# P5 THYROID CYTOLOGY

## P5-1 | Bethesda System Of Reporting Thyroid Cytology, Cytological And Histological Correlation And Cytological Diagnostic Pitfalls In Thyroid Lesions: An Institutional Experience

C. Rana[1]; P. Ramakant[2]; S. Babu[1]; K. Singh[2]; A. Mishra[2]; A. Singhai[1]

[1]Department of Pathology, King George's Medical University, Lucknow, U.P., India; [2]Department of Endocrine Surgery, King George's Medical University, Lucknow, U.P., India

**Objective:** The aims of the study were to evaluate the diagnostic application of Bethesda System of reporting Thyroid cytopathology, to review the cytomorphological spectrum, histologic- cytologic correlation and detailed discussion on various pitfalls in cytological diagnosis.

**Method:** This study included patients who underwent FNAC and/or histopathological evaluation, between June 2016- September 2017. The cytology smears and histology were retrieved and reviewed.

**Results:** The adequacy rate of cytology smears was 95.8%. Majority of the lesions (60.5%) fall under Bethesda category (BC) II with colloid goitre being the commonest. There were 4.2% cases, which came in BC III. The lesions suspicious for malignancy (BC V) included 2.3% cases while in 15.6% cases the diagnosis was given as a Malignancy (BC VI). The most common malignancy was Papillary carcinoma (50%) was followed by Anaplastic carcinoma (25%). Histo-cyto correlation was seen in 90% of the cases. most common category misdiagnosed on cytology was Follicular neoplasm. The malignancy rate in category I, II, III, IV, V and VI were 57.1%, 4%, 28.6%, 33.3%, 100% and 100% respectively. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy for malignant thyroid lesions were 88.9%, 100%, 100%, 96%, and 96.9% respectively.

**Conclusion:** Fine needle aspiration is s sensitive and specific method in diagnosing thyroid swelling. Onsite assessment of adequacy of smears can reduce the inadequacy rate significantly. Increasing Bethesda correlates well with increased risk of malignancies as well as malignancy rates were higher in our study population. AUS should be the last resort and not be used as wastebasket. The most commonly misdiagnosed BC is FN, hence such smears should be reported with extra caution.

## P5-2 | Cyto-Histologic Correlation Study in a Surgical Series of 522 Thyroid Nodules

I. Mora Guzmán; A. Freih Fraih; J. L. Muñoz de Nova; E. Bárcena; J. Cuesta; C. Marín; C. Gordillo; E. Torres; E. Martín; J. A. Jiménez Heffernan

*University Hospital La Princesa, Madrid, Spain*

**Objectives:** The aim of our study was to establish the precise cyto-histologic correlation of thyroid nodules at our hospital and to evaluate the utility of the Bethesda system.

**Methods:** A cyto-histologic correlation study between FNA samples and subsequent surgical specimens, during a 7 year period (2010–2017) was performed. Samples were classified according to Bethesda categories. Incidental papillary microcarcinomas were excluded. Diagnostic indicators were calculated as a screening test representing the need of surgical treatment (categories IV, V and VI as true-positive) and regarding malignancy detection (V and VI as true-positive). At our hospital, the procedure is performed by a team of expert radiologists (using ultrasonography and 23 gauge needles, without aspiration) and pathologists that evaluate the material. Approximately ten patients can be evaluated in one hour. In order to avoid diagnostic delays, if non-representative or dubious cases are present they are communicated the day after to the Radiology Department that gives a new date (the next week) to the patient.

**Results:** In a series of 522 patients (83% women) there were 184 (35%) malignant tumours, papillary carcinoma being the most prevalent (84%). Malignant rates for diagnostic categories were: I, 0%; II, 1.5%; III, 6.4%; IV, 31%; V, 86.5%; VI, 100%. A robust correlation was identified between categories on statistical analysis. For the "screening test" analysis, sensitivity was 98.9%, specificity 84.4%, positive predictive value 69.6%, negative predictive value 99.5%, and diagnostic accuracy 88.2%. Analysing the accuracy to detect malignancy, values were: sensitivity 98.6%, specificity 97.6%, positive predictive value 93.5%, negative predictive value 99.5%, diagnostic accuracy 97.9%.

**Conclusion:** Cyto-histologic correlation among thyroid nodules is very high and the Bethesda categories are a reliable system to report results. The main clue for increasing the diagnostic accuracy of cytology is a close relation between expert radiologists and pathologists.

## P5-3 | Cytomorphologic Features of Anaplastic Thyroid Carcinoma, Rhabdoid Variant; A Case Report

T. Yalta; E. Genç; B. Tutuğ; N. Can

*Pathology Department, Trakya University Medical School, Edirne, Turkey*

Anaplastic or undifferentiated carcinoma of the thyroid is a rare malignancy of the elderly patients and shows a slight female predominance. Rhabdoid variant of this carcinoma is extremely rare and aggressive.

A 71 years old woman presented a large painful neck mass. Ultrasonography revealed two solid hypoechoic nodules in the right lobe of the thyroid. The largest nodüle size was 3 cm. Fine needle aspiration was performed to the patient and aspiration cytology showed malignant, large,round, loosely cohesive pleomorphic cell population containing eccentric nuclei and these cells exhibited wide variation in their size and shape. These plasmocytoid malignant cells had dense eosinophilic abundant cytoplasm with esinophilic cytoplasmic globules. Their nuclei were vesicular and some were multinucleated. Immunohistochemistry was performed to the tissue block of the aspiration and these malignant cells were positive with CK7 and vimentin, weakly positive with thyroglobulin,myogenin and TTF-1. Pancytokeratin,LCA,calcitonin, desmin,CD3, CD20 and SMA. And with these findings our diagnosis was rhabdoid variant of anaplastic carcinoma.

In conclusion, cytopathologists who are interested in evaluation of thyroid aspiration cytology must also keep in mind this extremely rare entity.

## P5-4 | Thyroiditis and Papillary Thyroid Carcinoma: FNAB and Biopsy Coincidence and its Influence on Diagnosis

J. Dušková

*CGOP s.r.o. and 1st Faculty of Medicine, Charles University, Prague, Czech Rep*

**Objectives:** Thyroiditis represents a known risk for malignancy development in thyroid. The impact of coinciding thyroiditis in the FNAB on diagnosis of the most frequent carcinoma – papillary (PTC) was investigated.

**Methods:** The coincidence of PTC and thyroiditis in biopsy and FNAB within a six- year period 2012–2017 in two laboratories (CGOP and VFN) was compared. The influence of coinciding thyroiditis on the FNAB classification in the Bethesda 2010 system was evaluated via histopathology confirmations.

**Results:** Within the six-year period the incidence of PTC in biopsy was nearly identical: 18.8% and 18.9%, altogether in 631 thyroid resecates. Similarly, the incidence of FNAB diagnosis of PTC in all three possible Bethesda 2010 diagnostic categories summarized: BIII, BV, and BVI was very close 2.2% and 2.6% respectively in altogether 7,167 FNABs. The coinciding inflammation was substantially lower in FNABs 9.4% (CGOP) and 15.6% (VFN), compared to the resecates that exhibited inflammation in about one half of the cases – 53.6% (CGOP) and 45.1% (VFN). PTC confirmation in all three Bethesda categories summarized was 95.7%. The results of FNABs with coinciding inflammation did not differ from inflammation free cases, although they were experienced as more difficult to evaluate.

**Conclusions:** Coinciding diagnoses in thyroid are common. The substantially lower coincidence of PTC and inflammation features in FNABs compared to biopsies is seemingly a function of sampling. The suspicious frequently nodular lesion representing PTC on sonography can be aspirated without the surrounding inflammation. In our study, the coinciding inflammation in the FNAB did not negatively influence the positive predictive value for PTC.

## P5-5 | Use of Thyroid Peroxidase in the Differential Diagnosis of Thyroid Papillary Carcinoma Vs Non-Invasive Follicular Thyroid Neoplasia With Papillary Nuclear Characteristics. Our Experience

R. Ugalde Herrá[1]; L. Fernández Fernández[1]; A. Fernández Ibáñez[2]; M. P. González Gutierrez[1]; A. Alonso-Fernández[1]; H. Torres Rivas[1]

[1]*Central Universitary Hospital of Asturias Oviedo, Asturias, Spain;* [2]*University of Oviedo Faculty of Medicine Oviedo, Asturias, Spain*

**Introduction:** One of the most important changes in the new classification for thyroid tumors was the introduction of the term non-invasive follicular thyroid neoplasia with papillary nuclear characteristics (NIFTP), this lesion has a benign biological behavior. Therefore, it's very important to reach a correct diagnosis in both biopsy and cytology. Ultrasound guided Fine needle aspiration (FNA) is considered the most suitable method to obtained thyroid cytology sample, and Bethesda system is one of the more common classification method.

**Objectives:** To demonstrate the usefulness of Thyroid Peroxidase IHC test (TPO), in the differential diagnosis between thyroid papillary carcinoma (TPC) and NIFTP.

**Methods:** The papillary carcinoma diagnoses were reviewed and NIFTP during 2017. The determination of TPO was carried out both in the surgical sample and in the cell block.

**Results:** 19 cases were reviewed: 16 TPC and 03 NIFTP. Ten surgical samples of TPC have the previous cytology diagnostic of Bethesda V-VI, and TPO IHC was negative in all of them. Two of the 3 NIFTP surgical samples had previous FNA diagnosis (Bethesda III and IV). The TPO IHC was positive in all NIFTP cases.

**Conclusions:** At least in this study, TPO IHC proved to be an excellent tool in the differential diagnosis of benign and malignant thyroid injury. It seems to be an inversely proportional relationship between the expression / intensity of the technique and the "degree of malignancy". We post TPO IHC as a complementary test for samples of thyroid nodules, with a high diagnostic yield, in our case 100% of cases.

## P5-6 | The Utility of Fine Needle Aspiration Cytology of the Thyroid Lesions as Pre-Operative Diagnostic Tool: A Cyto-Histological Correlation Study

A. Kaur[1]; J. Jairaman[1]; N. Md. Isa[1,2]

[1]*Sunway Medical Centre, No 5, Jalan Lagoon Selatan, Bandar Sunway, Selangor Darul Ehsan, Malaysia;* [2]*National University of Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, Cheras, Kuala Lumpur, Malaysia*

**Objective:** Fine needle aspiration cytology (FNAC) of the thyroid is one of the initial diagnostic tools in the investigation of thyroid nodules. This diagnostic procedure is cost-effective, simple and fast with minimal complications. The aim of this study is to determine the diagnostic accuracy of FNAC of thyroid lesions performed in Sunway Medical Centre, a private hospital at Malaysia providing comprehensive tertiary healthcare services to local and international patients.

**Method:** Records of all FNAC thyroid performed from Jan 2015 to June 2017 were retrieved from the Cytology Unit, Sunway Medical Centre. There was a total of 453 FNAC thyroid performed within the study period of which histopathological diagnosis were available for 76 cases for correlation purposes. The cytological interpretations and histopathological diagnoses were classified as benign and malignant. Cases that were reported as atypical on cytology were excluded while specimens with little or no thyroid follicular epithelial cells and cases reported as cyst content were classified as unsatisfactory.

**Results:** Of the 76 cases investigated, 62 (77.2%) were diagnosed as benign cytologically while 14 (17.7%) cases were stated as malignant. Histopathological examinations confirmed 61 out of the 62 (98.4%) cytologically benign cases while 14 out of 14 (100.0%) cases diagnosed as malignant on cytology were proven malignant histologically. Our analysis showed diagnostic accuracy of 99.0% with sensitivity and specificity rates of 93.3% and 95.0% respectively. The positive predictive value was 100.0% and negative predictive value was 98.0%. Our unsatisfactory rate was 36.0% which is notably higher than the rates reported in other studies.

**Conclusion:** From this study, we concluded that FNAC is a reliable diagnostic tool in evaluating thyroid nodules pre-operatively and plays an important role in planning the surgical management of thyroid nodules.

## P5-7 | Cytopathology of Solid Variant of Papillary Thyroid Carcinoma: Is Cytological Diagnosis Feasible?

S. Agarwal; P. Guleria; R. Phulware; D. Jain; S. R. Mathur; V. K. Iyer

*All India Institute of Medical Sciences, New Delhi, India*

**Objectives:** Solid variant of papillary thyroid carcinoma (SVPTC) is rare and known to have less favourable outcome than classical PTC. Pre-operative diagnosis may facilitate an early and more aggressive management. However, cytological features of SVPTC are not well established. We evaluated the cytomorphology of SVPTC with the aim to assess feasibility of a pre-operative diagnosis on aspiration cytology.

**Methods:** A retrospective analysis of all SVPTC cases with available cytology reported over the last 3 years was done. Morphological details studied both on cytology and histology were architectural patterns, nuclear morphology including scoring of nuclear features and Bethesda category. Each architecture, viz papillae, solid clusters, solid fragments, trabeculae, and nests were defined beforehand.

**Results:** Seven cases of SVPTC were retrieved. Cytology revealed more than one architectural pattern in all and was a reflection of histology. Four cases showed a trabecular-predominant pattern, two microfollicle predominance and one prominent nests with few singly dispersed cells. Solid clusters and fragments were variably seen in all. Intranuclear inclusions were noted in 5 (71.4%), occasional (<3) in 4 and frequent (>3) in 1. Five (71.4%) had a nuclear score 3 on cytology, remaining two had a score of 2 and 1, respectively. True papillae, psammoma bodies, mitosis and necrosis were absent in all. The cases were categorized suspicious for malignancy (43%; 3/7), follicular neoplasm (29%; 2/7), malignant (14%; 1/7) and atypia of undetermined significance, favouring neoplastic (14%; 1/7).

**Conclusions:** Cases showing trabeculae/ solid clusters/ solid fragments/ nests as the predominant architectural pattern, a nuclear score of 3, absent papillae, psammoma bodies, mitoses and necrosis can be diagnosed as SVPTC on cytology. Some may show a prominence of microfollicles, and hence be misinterpreted as follicular variant of PTC. Definite diagnosis of these can be made only on histology on seeing solid/trabecular/nesting as the chief pattern.

## P5-8 | From A Thyroid's Rectal Adenocarcinoma Metastasis To An Analisys of the past 10 years of thyroid FNABs at the "IRCCS Istituto Nazionale Dei Tumori" Milan, Italy

C. Bovio; D. Clavenna; G. Pruneri

*IRCCS Istituto Nazionale dei Tumori, Milan, Italy*

**Objectives:** To address the role of FNAB in the diagnosis and management of thyroid metastases.

**Methods:** We report an unusual case of rectal adenocarcinoma metastasized in the thyroid and our 10-year experience in thyroid FNAB with special emphasis on thyroid metastases.

**Results:** On September 2016, a 43 years old man with a diagnosis of colo-rectal adenocarcinoma obtained on biopsy was admitted at our Institute. PET showed multiple liver metastases as well as a small nodule of the left lobe of the thyroid. The patient was therefore subjected to neoadjuvant chemo-radiotherapy and operated in January 2017. In February, a new PET showed an increased uptake within the thyroid left lobe and one cervical lymph node. A FNAB of the thyroid nodule was therefore performed, showing malignant tumour cells, morphologically and phenotypically suggestive of intestinal adenocarcinoma. In consideration of this unusual finding, we re-evaluated our experience in thyroid FNABs, focusing on metastastic involvement. Over the past 10-years, we diagnosed 581 FNABs using "The Bethesda system for reporting thyroid cytopathology". The diagnostic categories were as follows: I, 215 cases (37%); II, 108 (18.6%); III, 78 (13.4%); IV, 83 (14.3%); V, 44 (7.6); and VI, 53 (9.1%). Within the VI category, we found 44 primary tumours and 9 metastases (1.5% of the study population as a whole): the primary site was kidney, breast, colo-rectum (2 cases each) and lymphoma (1 case). The remaining two cases were pancreatic neuroendocrine carcinomas (NEC). All the metastatic cases were diagnosed by immunocytochemical panels including markers of tumour origin (i.e. CDX2 and TTF-1 in the reported case and chromogranin, synaptofisin and calcitonin in NEC.

**Conclusions:** Our data, collected in a single Institution over a 10-year period, confirmed that secondary thyroid involvement is an uncommon finding (0.1–3% in previous reports), that nevertheless requires an integrated clinico-pathological approach and complete phenotyping.

## P5-9 | The Impact of Rapid On-Site Evaluation on Thyroid Fine-Needle Aspiration Biopsy: A 2-Year Cancer Center Institutional Experience

R. G. Pastorello[1]; P. H. Pinto[1,2]; C. H. Credidio[1]; R. X. Reis[1]; T. A. Rodrigues[1]; M. C. Toledo[1]; C. Destefani[1]; L. B. Andrade[1]; C. A. L. Pinto[1]; M. A. Saieg[1,3]

*[1]A.C Camargo Cancer Center, São Paulo, Brazil; [2]Hospital de Base do Distrito Federal, Federal District, Brazil; [3]Santa Casa Medical School, São Paulo, Brazil*

**Objectives:** The impact of ROSE (rapid on-site evaluation) on thyroid aspirates has been a matter of extensive debate. We therefore reviewed all thyroid FNAB performed in our service in recent years in order to evaluate the impact of on-site assessment on our final adequacy and diagnostic rates.

**Methods:** All ultrasound-guided thyroid FNAB performed between July/2015 (when ROSE started to be used in our department) and July/2017 were retrospectively included. Data extracted included gender, age, mean number of needle passes and final cytological diagnosis. Whenever available, final histological diagnosis of the resected nodules were also reviewed from the electronic archives. ROSE was performed by experienced cytopathologists, with production of Diff-Quik stained slides for immediate evaluation. When ROSE was not performed, three needle passes were performed as default and samples were fixed in liquid-based preparations. Distribution of cases for each Bethesda system (BSRTC) category and their risk of malignancy were calculated in the two groups (ROSE and non-ROSE) and compared using chi-square test.

**Results:** An initial search obtained 4,649 cytology specimens, 3,469 (74.6%) with ROSE and 1,180 (25.4%) without. Patients were predominantly female (85.4%), with a mean age of 53 years. Specimen adequacy was 24% higher in the ROSE group (93.4% vs 69.4%; $p < 0.0001$), with a mean number of needle passes necessary for an adequate diagnosis of $1.48 \pm 0.71$ (median 1.0; range, 1–5), as opposed to the three needle passes used as default in the non-ROSE group. No statistical difference was seen in the risk of malignancy for each BSRTC category when the two groups (ROSE and non-ROSE) were compared.

**Conclusions:** Our data support ROSE as a valuable technique in thyroid FNAB, proven to significantly improve specimen adequacy and to decrease the mean number of needle passes necessary to achieve an adequate cytological diagnosis.

## P5-10 | Should We Wait Three Months for a Repeat Fine-Needle Aspiration of ND/AUS Thyroid Nodules? A Single Center Experience

R. G. Pastorello[1]; P. H. Pinto[1,2]; C. H. Credidio[1]; R. X. Reis[1]; T. A. Rodrigues[1]; M. C. Toledo[1]; C. Destefani[1]; L. B. Andrade[1]; A. G. Nascimento[1]; M. A. Saieg[1,3]

*[1]A.C Camargo Cancer Center, São Paulo, Brazil; [2]Hospital de Base do Distrito Federal, Federal District, Brazil; [3]Santa Casa Medical School, São Paulo, Brazil*

**Objectives:** The Bethesda System for Reporting Thyroid Cytopathology recommends repeat fine-needle aspiration biopsy (FNAB) as a management option for nodules classified under the atypia of undetermined significance (AUS) and non-diagnostic (ND) categories. The optimal timing for a repeat procedure, however, has been a source of debate. In this study, we aimed to evaluate the impact of early (≤ 3 months) vs. delayed (<3 months) repeat biopsy of nodules initially deemed as AUS or ND.

**Methods:** We retrospectively reviewed all ultrasound-guided thyroid FNAB performed in our service between July/15 and July/17 with an initial diagnosis of ND or AUS and repeat respiration, dividing them into two groups according to the time interval for nodule reassessment: ≤ 3 months (group 1) and >3 months (group 2). Percentage of cases with persistent ND or AUS diagnoses after repeat aspiration were calculated for each group and compared using chi-square test.

**Results:** In the time period reviewed, 193 thyroid FNAB had available follow-up data regarding repeat aspiration and were included in the study, corresponding to 127 (65.8%) cases assigned as ND and 66 (34.2%) as AUS. Among the ND cases, 21.8% remained non-diagnostic in group 1 and 16.7% in group 2 ($p = 0.46$). For the cases initially diagnosed as AUS, a second procedure yielded a repeat indeterminate diagnosis in 36.8% of the nodules from group 1 and in 12.8% from group 2 ($p = 0.02$), a significant decrease of 24%.

**Conclusions:** Time interval between aspirations had no statistical impact on nodules initially assigned as ND. Repeat aspiration of AUS lesions performed within 3 months or less from the first biopsy was associated with a higher rate of a recurrent indeterminate diagnosis.

## P5-11 | Diagnostic Utility of Cytomorphological Features In Evaluation Of Hürthle Cell Thyroid Lesions By Fine-Needle Aspiration

C. Padilla; N. Combalia; M. R. Bella; R. Orellana; M. R. Escoda; M. Prenafeta; S. Barcons; J. C. Ferreres

*Parc Taulí Hospital Universitari. I[3]PT, Universitat Autónoma de Barcelona, Sabadell, Barcelona, Spain*

**Objective:** Lesions of the thyroid gland composed of Hürthle cells encompass pathologic entities ranging from hyperplastic nodules with oncocytic cells to Hürthle cell carcinomas. The cytologic distinction between these entities may be difficult. The purpose of this study is to evaluate some cytological features to improve neoplastic Hürthle cell lesions diagnosis to minimize unnecessary surgery.

**Methods:** Retrospective review of 68 thyroid fine-needle aspiration with cytological diagnosis of Hürthle cell lesions (5 Bethesda II, 53 Bethesda III and 10 Bethesda IV), all with surgical follow-up, blinded to clinical data, ultrasound features and cytological or histological diagnosis. We evaluated the presence of: colloid, amount of cellularity, macrofollicles, discohesive single cells, monolayered sheets, naked nuclei, small cell dysplasia, large cell dysplasia, nuclear atypia, binucleated cells, conspicuous nucleoli, nuclear grooves, fibrous tissue and transgressing blood vessels. Cases were divided on the basis of the histologic diagnosis. $\chi^2$ test was used to evaluate each of the cytomorphological features for statistical significance in predicting histological diagnosis.

**Results:** Histology showed 42 cases of oncocytic adenomatoid nodule in nodular goitre, 13 Hürtle cell adenomas, 10 Hürthle cell carcinomas and 3 oncocytic papillary carcinomas. At cytological review, all histological types showed high cellularity and small and large cell dysplasia. Nucleoli and fibrous tissue were more evident in adenomas. Nuclear grooves were present in three carcinomas, one hyperplasia but none adenomas. Transgressing blood vessels were slightly more frequent in carcinomas.

None of the 14 cytological features evaluated showed to be statistically significant to differentiate among the three entities.

**Conclusions:** In this study we didn't found helpful cytological criteria in distinguishing different types of Hürthle cell thyroid lesions.

## P5-12 | Pigmented Variant of Medullary Thyroid Carcinoma – A Case Report

I. Madonsela[1]; E. Maema[1]; N. Heunis-Snyman[1,2]; J. Dinkel[1,2]

*[1]NHLS, Tshwane, Gauteng, South Africa; [2]University of Pretoria, Tshwane, Gauteng, South Africa*

**Clinical History:** A 72- year- old patient that presented with a left anterior neck mass, possibly of thyroid origin.

**Background:** A monotonous population of loose-lying and trabecularly arranged cells, some with plasmacytoid features. Some of the cells were oncocytic with cytoplasmic granules while others showed intranuclear cytoplasmic inclusions. Occasional large mono-, bi and multinucleated cells were present. Possible focal pigment was noted in the background. The cytological features were highly suggestive of malignant melanoma but due to the topography of the mass, a medullary carcinoma of the thyroid was considered as a differential diagnosis. Immunocytochemical stains including HMB-45 and calcitonin were performed, HMB-45 for melanoma proved to be negative but calcitonin for medullary thyroid carcinoma (MTC) was strongly positive.

**Histological Findings:** Histological examination of the thyroid lobe showed extensive involvement by medullary carcinoma.

**Biochemical Results:** An elevated serum calcitonin level = 5563.0 ng/l.

**Discussion:** MTC is a rare neuroendocrine tumour arising from the parafollicular or C (for calcitonin) cells. It secretes calcitonin, causing elevated serum levels which can be used as tumour markers for MTC. In common with other neuroendocrine tumours, MTC can produce hormonal and non-hormonal substances e.g adrenocorticotropic hormone, mucin and melanin (pigmented/ melanin-producing variants). The presence of melanin pigment, poses a diagnostic dilemma in differentiating this variant of MTC from metastatic melanoma.

## P5-13 | Follow-Up of Thyroid Nodules Categorized as Atypia of Undetermined Significance or Follicular Lesion of Undetermined Significance (AUS/FLUS): An Institutional Experience

G. Ramos-Rivera; S. Segura; S. Khader

*Albert Einstein College of Medicine/Montefiore Medical Center, Bronx, NY, USA*

**Objectives:** Follow-up cases diagnosed in the "atypia of undetermined significance/follicular lesion of undetermined significance"(AUS/FUS) category, also known as Bethesda Category III. Analyse the associated risk of malignancy and compare our results with current guidelines.

**Methods:** We used the Clinical Looking Glass software to create a cohort and extract thyroid FNAs reports along with subsequent surgical management, to assess the histological correlation. These patients are fed to the Clinical Looking Glass software from the electronic medical records of Montefiore Medical Center. We included reports from January 2013 to December 2016. The data extracted is de-identified and exported in an excel file for analysis. We correlated the cytology diagnosis with the surgical pathology diagnosis to evaluate the rate of malignancy along with appropriate management in this category.

**Results:** From 288 patients diagnosed with AUS, 39 patients (14%) had subsequent surgical treatment. From those, 29/39 patients (54%) had a benign surgical outcome, while 18/39 (46%) surgical diagnoses were malignant; 14/18 (77%) of these cases did not have an FNA diagnosis higher than AUS (see table 1) and had surgical resection. The risk of malignancy outcome for our study population is 4.9%. Only one patient had more than one lesion: papillary thyroid carcinoma (PTC), micro PTC, and a minimally invasive follicular carcinoma.

**Conclusions:** Our study showed that our institution's risk of malignancy outcome for the Bethesda Category III is on the lower end of the classification, which is 5–15%. The majority of these cases had a PTC variant, comprising 93% of all cases. Our institutional experience compares to prior studies on risk of malignancy outcome.

## P5-14 | Combined Us-Guidance and Liquid Based Cytology (LBC) Enhance the Diagnostic Role of Thyroid FNAC. A Retrospective Study of Our Cases Reported in a Nineteen Years Period

G. Kazamias; E. Asimis; A. Rapti; E. Chliara; G. Cavallo; E. Mastorakis

*Venizeleion General Hospital, Heraklion, Crete, Greece*

**Objectives:** In 1998, the evaluation of FNA-thyroid samples in the Cytopathology laboratory of our hospital began. Since then, our objective was to have high quality and adequate specimens. We had to choose aspiration and preparation methods that would minimize cell loss and would also preserve morphologic details for an accurate diagnosis. The majority of thyroid nodular lesions, measuring even few millimeters, are detectable by ultrasonography (US), after the introduction of high resolution ultrasound imaging. Liquid Based Cytology (LBC) promotes the objectification of the morphological diagnosis and also allows the implementation of ancillary techniques on the same sample.

**Methods:** In a nineteen years period (1998–2017) a total of 13 958 aspirates were examined. In 2003, the US guided FNA was introduced by the Radiology Department. Two years later, we started to apply LBC(ThinPrep®)using all of the aspirated material for Pap stained slides and three years later immunocytochemistry on the residual material, was introduced. Finally in 2010 we adopted the TBSRTC classification and the molecular detection of BRAFV600E mutation began to be applied.

**Results:** The number of cases examined from 1998 has a trend to increase over time. As the number of examined samples increased the number of malignant reports increased as well. The vast majority were PTCs followed by MTCs. The follicular neoplasms were mainly adenomas or FTUMP. At the same time there is an improvement in the diagnostic performance, as the percentage of inadequate samples has dropped over the years from 25–30% to 3.5–6%. Moreover, the mean diameter of the malignant nodules aspirated dropped from 2.91 to 0.94 cm.

**Conclusion:** By the years, US-FNA combined with LBC (ThinPrep®) enhanced the diagnostic role of cytological examination

in our laboratory. Today, by combining modern techniques, the leading role of Thyroid Cytology in preoperative diagnosis is maintained and enhanced, contributing in the precise clinical management of our patients.

## P5-15 | Is There Any Value in Qualifying Thyroid Fine Needle Aspirations That Are Less Than Optimal?

H. Cho; Y. L. Oh

*Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea*

**Objectives:** Nondiagnostic/unsatisfactory results are one of the major limitations of thyroid fine needle aspiration (FNA). We modified the Bethesda system criteria for reporting nondiagnostic/unsatisfactory thyroid cytopathology to better stratify the risk of malignancy in these nondiagnostic samples.

**Methods:** A total of 1450 cytopathologic specimens that did not meet optimal adequacy criteria were retrospectively analyzed using an institutional database from April 2011 to March 2016. Malignancy rates were calculated based on sub-classification of the nondiagnostic/unsatisfactory category and sonographic patterns using matched surgical pathology. Rates were compared with those of 1446 corresponding adequate FNAs from July 2013 to December 2013.

**Results:** Upon resection, 63.2% of nondiagnostic, 36.7% of unsatisfactory + benign, 72.5% of unsatisfactory + atypia (or follicular lesion) of undetermined significance (AUS/FLUS), 98.1% of unsatisfactory + suspicious for malignancy, and 100.0% of unsatisfactory + malignant cytopathology cases were confirmed to be malignant on surgical pathology. In nodules with inadequate specimens, those with highly suspicious sonographic patterns had a malignancy rate (93.2%) higher than the others (45.5%) (p for difference <0.001). Nodules with unsatisfactory + benign specimens had a higher malignancy rate (36.7%) than those with satisfactory benign FNA (14.3%) (p = 0.020). For AUS/FLUS, the malignancy rate of inadequate FNAs (72.5%) was higher than that of adequate specimens (51.3%) (p = 0.027).

**Conclusions:** This study confirmed that sparse cellular samples with a few groups of benign follicular cells should not be considered representative of the underlying benign lesion. There might be value in qualifying AUS/FLUS cases that are less than optimal.

## P5-16 | Noninvasive Follicular Thyroid Neoplasm With Papillary-Like Nuclear Features: Can Cytology Face the Challenge of Diagnosis on the Light of the New Classification?

C. Díaz del Arco[1,2]; S. Merino Menéndez[1]; M. Saiz-Pardo Sanz[1]; M. Suárez Solís[1]; M. J. Fernández Aceñero[1,2]

*[1]Clínico San Carlos Hospital, Madrid, Spain; [2]Complutense University of Madrid, Spain*

**Objectives:** The most recent WHO classification of thyroid neoplasms has removed the category of "encapsulated follicular variant of papillary thyroid carcinoma (PTC) (without capsular or vascular invasion), suggesting the new nomenclature "noninvasive follicular thyroid neoplasm with papillary-like nuclear features" (NIFTP). Our aims are to assess the cytological findings of NIFTP, conventional papillary thyroid carcinoma (C-PTC) and invasive follicular variant of papillary thyroid carcinoma (IFV-PTC) and see if there are cytological differences between groups.

**Methods:** We have reviewed and compared the cytological features of 28 thyroid FNAC. We have included all NIFTP diagnosed in our institution in the last 17 years (n = 6) and we have randomly selected cases of C-PTC (n = 14) and IFV-PTC (n = 8).

**Results:** NIFTP cases occurred in patients between 30 and 85 years (mean:55). Lesions were located in left thyroid lobe in 33.3%, right thyroid lobe in 50% and isthmus in 16.6% of cases. Size ranged between 7 and 15 mm (mean: 10.8). When comparing NIFTP and C-PTC cases, NIFTP showed significantly less papillary or pseudopapillary architecture, more flat groups and microfollicles, less tridimensionality, giant cells and nuclear grooves. We observed a trend towards significance for smear cellularity and amount of cytoplasm. Presence of nuclear grooves was the only significant difference between NIFTP and IFV-PTC cases. The differences between groups for percentage of papillary or pseudopapillary architecture and tridimensionality showed a trend towards significance. Smear cellularity, amount of colloid, presence of necrosis, pleomorphism or atypia, nuclear pseudoinclusions, type of chromatin and nucleoli were not significant.

**Conclusions:** No cytopathological feature can differentiate between NIFTP and IFV-PTC. In accordance with the recently accepted category, we recommend PTC smears with cells arranged in a predominantly follicular architecture to be reported as Bethesda IV category with descriptive terms, to avoid false positive cases.

## P5-17 | Cytological Diagnosis of Hürthle Cell Lesions: Our Experience

C. Díaz del Arco[1,2]; T. Ganado Díaz[1]; P. Pérez Alonso[1]; I. Subhi-Issa Ahmad[1]; M. J. Fernández Aceñero[1,2]

*[1]Clínico San Carlos Hospital, Madrid, Spain; [2]Complutense University of Madrid, Spain*

**Objectives:** Diagnosis of thyroid Hürthle cell (HC) lesions by FNA is controversial for several reasons, including the absence of a minimum percentage of HC required to diagnose a thyroid nodule as a HC nodule, the lack of clear-cut criteria for distinguishing neoplastic vs. non-neoplastic and benign vs. malignant lesions and the existence of several classification systems. Our aim is to identify cytological features related to neoplastic (adenoma or carcinoma) and malignant histology.

**Methods:** We have reviewed all cytological specimens (n = 359) with HC diagnosed in our institution between 2000–2016. We have reviewed clinical and cytological features of surgical cases and correlated them with histological diagnosis.

**Results:** 86.4% of patients were women. Patient age ranged from 22 to 89 years (mean:58.57). Cases were mainly diagnosed as Bethesda category II (54.3%) and category IV (42.6%). Lesions were mainly located in right (47.9%) and left thyroid lobe (47%). Mean lesion size was 21 mm. Surgery was performed in 63.8% of cases, and 67.7% of patients were first treated by total thyroidectomy. Histologically, 34.1% of cases were neoplastic and 7.5% were malignant. We found a significant association between neoplasia and highly cellular smears, absence of colloid, presence of microfollicles, large cell dysplasia, prominent nucleoli or macronucleoli, coarse chromatin, nuclear grooves and inclusions, nuclear irregularity and pleomorphism. Absence of colloid, high cellularity, >25% of isolated HC, presence of tridimensional groups, transgressing vessels, nuclear irregularity, prominent nucleoli or macronucleoli, coarse chromatin, hyperchromatism, pleomorphism and diffuse large cell dysplasia were features significantly associated with malignancy.

**Conclusions:** No cytological feature alone can determine if a HC nodule diagnosed by FNA is a neoplastic or malignant lesion. However cytological specimens must be carefully studied and minimum features such as cellularity, presence of colloid or cell arrangement should be reported. Individualized protocols can be made depending on the institutional experience.

## P5-18 | Fine-Needle Aspiration of Thyroid Papillary Carcinoma: Institutional Experience and Preoperative Sonographic Features

C. Díaz del Arco[1,2]; I. Subhi-Issa Ahmad[1]; S. Merino Menéndez[1]; J. Lloret Hoyo[1]; L. Ortega Medina[1,2]

*[1]Clínico San Carlos Hospital, Madrid, Spain; [2]Complutense University of Madrid, Spain*

**Objectives:** The incidence of papillary thyroid carcinoma (PTC) is increasing due to the widespread use of ultrasound, and fine-needle aspiration cytology (FNAC) is essential for its preoperative diagnosis. According to the Bethesda system, the risk of malignancy for categories V and VI is 60–75% and 97–99%, respectively. Some authors have reported that negative histological results after a PTC preoperative diagnosis are very rare and they could be associated with disappearing tumors. Our aim is to review our experience with PTC FNAC.

**Methods:** We have reviewed all thyroid FNAC diagnosed as PTC (n = 245) in our institution between 2010–2017.

**Results:** Most patients were women (81%), with an age ranging from 18–85 years (mean: 52). Lesions were mainly located in left (47.5%) and right thyroid lobe (42.6%). On FNAC, 66.9% of cases were diagnosed as PTC and 33.1% as suspicious for PTC. On ultrasound, they showed calcifications (63.5%), ill-defined borders (55.5%), intrinsic vascularity (57.4%) or a high anteroposterior-to-transverse ratio (11.5%). A total thyroidectomy was performed in 88.6% of patients (mean time to surgery: 1.5 months). PTC were mainly conventional (81.7%), follicular variant-PTC (14%) and oncocytic variant-PTC (3.4%). 28% of tumors were multicentric, and most of them were stage I (83.5%). Lymphocytic thyroiditis was observed in 8.2% of cases. The rate of wrong diagnosis was 4.1% (9 cases, false positive rate: 3.6%). There were 4 adenomatoid nodules, 2 follicular adenomas, 1 hyalinizing trabecular adenoma, 1 calcified nodule and 1 follicular carcinoma. A wrong diagnosis was significantly associated with a suspicious FNAC diagnosis and they showed significantly less calcifications (12.5%) than PTC cases.

**Conclusions:** FNAC is an excellent tool for diagnosing PTC and it has a high positive predictive value. However, there may be false-positive cases because PTC-like nuclei can be found in benign thyroid lesions and some tumors may spontaneously regress before surgery.

## P5-19 | Rates of Thyroid Malignancy of Atypia of Undetermined Significance/Follicular Lesion of Undetermined Significance (AUS/FLUS) Category: An Institutional Experience

J. H. Ahn[1]; Y. K. Kim[1]; A. Kim[1]; W. Y. Park[1]; D. Y. Park[1,2]; G. Y. Huh[1,2]; C. H. Lee[1,2]; K. Y. Choi[1,2]

*[1]Department of Pathology, Pusan National University Hospital, Busan, Republic of Korea; [2]Department of Pathology, School of Medicine, Pusan National University, Yangsan, Gyeongsangnam-do, Republic of Korea*

**Objectives:** Fine needle aspiration (FNA) of thyroid nodules is the best choice of surgical decision making in thyroid cancer. The Bethesda System is the most widely used system for reporting thyroid FNA. We present our institutional experience with thyroid nodules diagnosed as atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS) and the subsequent outcome.

**Methods:** Cytology results with AUS/FLUS in thyroid FNA were searched. The data were collected from electronic medical record system (EMR) of our institution from 2013 to 2014. The results of repeat FNA and/or histologic diagnosis.

**Results:** A total of 4530 FNAs of thyroid nodules were performed for two years and 346 cases (7.6%) with AUS/FLUS result were included in this study. Of the 346 cases, repeat FNA and/or surgical follow-up was available in 217 cases. 32.9% were re-classified with

benign (114 cases). There were fifty-six malignant cases confirmed by surgical excision, with an overall malignancy rate of 16.2%.

**Conclusions:** The malignancy rate of AUS/FLUS cases is similar to those reported for cases. Our study validated the efficacy of AUS/FLUS category in the Bethesda System for reporting thyroid cytopathology.

**Keywords:** Atypia of undetermined significance, fine needle aspiration, The Bethesda System.

## P5-20 | Ultrasound-Guided Fine Needle Aspiration of Thyroid Gland Performed by Pathologist. A Fact in Spain. Procedure Optimization

S. Junceda Antuña; M. P. González Gutierrez; C. Miguel Ruiz; L. M. Fernández Fernández; M. Eiroa Teijeiro; A. Astudillo González; H. E. Torres Rivas

*Hospital Universitario Central de Asturias*

**Introduction:** Fine needle aspiration (FNA) is highly efficient technique, more simple and economic than other diagnostic procedures such as core needle biopsy, and with much fewer side effects. Several publications have demonstrate the effectiveness and efficiency of this technique, which becomes more precise when guided by ultrasound (US-guided FNA). This fact has been confirmed by daily practice in our hospital.

**Objectives:** To present the results obtained in thyroid FNA in our center, demonstrating that US-guided FNA is an efficient and accurate technique, especially when performed by a properly trained pathologist.

**Methods:** Ultrasound-guided FNAs on thyroid nodules performed by pathologist from January to June 2017 were quantified. Clinical data for age and sex of the patient were collected, as well as the type of request and the ultrasonographic characteristics of the nodules. The number of punctures performed and the diagnoses obtained were also documented. The results were classified according to Bethesda system for reporting thyroid cytopathology.

**Results:** During the first half of 2017, 130 ultrasound-guided FNAs on thyroid nodules were performed by pathologist in our hospital. The average age of the patients was 58.5 years, which were mostly women (80%). The mean size of the thyroid nodules was 22.89 mm (ranging from 5 to 55) and 55% of them affected the right thyroid lobe. In all of the cases the taken sample was sufficient, having done only 1 needle passes in 57%. According to Bethesda system, 117 cases were diagnosed as category II, 1 as category III, 8 as category IV and 3 as categories V or VI.

**Conclusions:** According to the obtained results we can affirm that the pathologist is becoming increasingly essential in the implementation of US-guided FNA, in order to reduce the number of non-evaluable results and to increase the effectiveness of the procedure.

## P5-21 | The Usefulness of Immunocytochemistry of CD56 in Determining Malignancy From Indeterminate Thyroid Fine Needle Aspiration Cytology

H. Cha; J. Pyo; S. Hong

*Gangnam Severance Hospital, Seoul, Republic of Korea*

**Objectives:** Fine Needle Aspiration Cytology (FNAC) serves as a safe, economic tool in evaluating thyroid nodules. However, about 30% of the samples are categorized as indeterminate. Hence, many immunocytochemistry (ICC) markers have been studied but there has not been a single outstanding marker. We studied the efficacy of CD56 with HBME-1 in making diagnosis in Bethesda Reporting System of Thyroid (TBRST) category III.

**Methods:** We reviewed Thin prep liquid based cytology (LBC) samples with Papanicolaou stain from July 1st to December 31st 2016 (2195 cases), and selected TBRST category III cases (n = 363). 26 cases was histologically confirmed as benign (6 cases, 23%) or malignant (20 cases, 77%) and stained 26 LBC slides with HBME-1 and CD56 through cell transfer method. For evaluation of reactivity of ICC, we chose atypical follicular cell clusters.

**Results:** CD56 was not reactive in 18 out of 20 cases (90%) of malignant nodules and showed cytoplasmic positivity in 5 out of 6 cases (83%) of benign nodules. CD56 showed high sensitivity (94.7%) and relatively low specificity (71.4%) in detecting malignancy ($p = 0.002$). HBME-1 was reactive in 17 out of 20 cases (85%) of malignant nodules and was not reactive in 5 out of 6 cases (83%) of benign nodules. HBME-1 showed high sensitivity (94.4%) and relatively low specificity (62.5%) in detecting malignancy ($p = 0.004$). CD56 and HBME-1 combined showed lower sensitivity (94.1% vs. 94.7%) and higher specificity (83.3% vs. 71.4%) in detecting malignancy when compared to using CD56 alone.

**Conclusions:** Using CD56 alone showed relatively low specificity in spite of high sensitivity for detecting malignancy. Combing with HBME-1 could raise specificity. Thus we suggest that CD56 could be a useful preoperative marker for differential diagnosis of TBRST category III samples.

## P5-22 | Bethesda III Thyroid Nodules and Thyroseq Genomic Classifier (GC) Testing: Prevalence of Driver Mutations in Matched Resected Lesions and Potential Implications in Management Approach

C. Ponchiardi; I. Laklouk; S. Cerda

*Boston University Medical Center, Boston, MA, USA*

**Objectives:** To evaluate the prevalence of driver mutations using ThyroSeq (GC) testing in Bethesda III fine needle aspirated (FNA)

thyroid nodules with matched surgical specimens and the potential implications in management approach.

**Methods:** We selected 270 thyroid nodules from our institution, with FNA diagnosis of indeterminate cytology (Bethesda III) and corresponding ThyroSeq molecular testing from January 2015 to December 2017. Each case was then correlated with the corresponding surgically resected nodule and classified into subcategories according to their surgical pathology outcome and ThyroSeq (GC) test result. Fisher exact test was used for statistical comparison between groups and statistical significance was $p < 0.05$. All analyses were performed using STATA.15 software.

**Results:** Amongst the 76 FNA cases with corresponding resected nodules, ThyroSeq testing showed 25 (33%) were negative, 6 (8%) currently negative, 41 (54%) positive for an isolated RAS/RAS-like mutation, 4 (5%) positive for an isolated BRAF V600E/BRAF V600E-like mutation and 0 (0%) positive for multiple high-risk mutations. The most prevalent histological diagnosis in the negative and currently negative subcategories was hyperplastic lesions 56% and 33%, respectively ($p = 0.9$). In isolated RAS/RAS-like mutations it was 39% hyperplastic lesions followed by 29% Follicular Variant Papillary Thyroid Carcinoma (PTC-F) and 15% Noninvasive Follicular Thyroid Neoplasm with Papillary-like Nuclear Features (NIFTP) ($p = 0.7$). For BRAF V600E/BRAF V600E-like mutations, Classic Papillary Thyroid Carcinoma (PTC-C) was 100%. The most prevalent mutation in PTC-C was BRAF V600E (44%) followed by NRAS (33%). NRAS was the most prevalent mutation in NIFTP (43%), PTC-F (33%) and hyperplastic lesions (58%) ($p = 0.094$).

**Conclusions:** Our study shows NRAS as the most prevalent mutation in BRAF V600E-negative nodules (benign and malignant) and no significant statistical difference between the isolated RAS/RAS-like mutations in the different diagnostic subcategories, thus proving to be of limited value in predicting malignancy or potential management of indeterminate thyroid nodules.

## P5-23 | Is There Still a Role For Giemsa in Liquid-Based Thyroid Cytology?

A. Caeiro[1]; A. T. Alves[1,2]; A. L. Ferreira[1]; M. G. Gasparinho[1]

*[1]Hospital Prof. Doutor Fernando Fonseca, Amadora, Portugal; [2]Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal*

**Objectives:** Assess the importance of the Giemsa stain in liquid-based thyroid aspiration cytology, in the evaluation of colloid and cytological features.

**Methods:** We revised 64 cases of liquid-based thyroid cytology specimens, stained with Papanicolaou and a modified Giemsa stain (MGS). After collection and processing in the ThinPrep® Processor, the MGS sample is ejected automatically onto a dry container, instead of a fixative-bath. The slide is then air-dried and stained with Giemsa. The GMS slide was always processed after Papanicolaou.

Two sets were made according to the stain used and independently reviewed by two observers, a trained cytotechnologist and a pathologist, without knowledge of the previous diagnosis or clinical information.

Parameters such as presence and type of colloid, nuclear and cytoplasmic features, Bethesda category (2018ed) and diagnosis, were evaluated. Correlation between the two stains was established as concordant, minor discordance and major discordance.

**Results:** There was a 67% concordant and 33% discordant rate concerning the presence/absence of colloid. In 14.3% there was a change from absent/doubtful colloid in Papanicolaou, to present in MGS.

Regarding Bethesda/Diagnosis, we found 51.6% concordant and 48.4% discordant rates. Of the discordant cases, 45.2% were assumed to be related to cellularity/adequacy (MGS was always done with the remaining material). In our population, 8% had a diagnosis of Nondiagnostic (Cystic lesion) with Papanicolaou that was reclassified as goiter/colloid cyst with MGS.

**Conclusions:** The use of MGS avoided the repetition of the fine-needle aspiration procedure in 8% of the cases with a diagnosis of cystic lesion (Papanicolaou) that changed to goiter/colloid cyst with MGS.

There were no significant differences between the two stains, taking into consideration the representativeness of the MGS preparation.

We consider that both stains are representative, and can be used according to personnel or institutional preference.

## P5-24 | Diagnostic Approach to Niftp by Us Guided Fnab

E. Thodou[1]; C. Sarantopoulou[2]; E. Evagellou[3]; K. Demislis[3]; A. Tsekouras[4]; A. Armoni[4]; G. Triantafyllidis[5]; P. Skoufogiannis[6]; G. Kontogeorgos[7]

*[1]Private Cytologist, Volos, Greece; [2]Private Cytologist, Patras, Greece; [3]Private Endocrinologist, Volos, Greece; [4]Private Endocrinologist, Patras, Greece; [5]Private Radiologist, Volos, Greece; [6]Achillopouleion General Hospital, Volos, Greece; [7]G. Genimmatas General Hospital, Athens, Greece*

**Objectives:** Non Invasive Follicular Tumor with Papillary-Like Nuclear Features (NIFTP) is a novel entity in thyroid pathology. Preoperative fine needle aspiration biopsy (FNAB) performed in patients with NIFTP yield mostly indeterminate results, Bethesda System for reporting thyroid cytology (TBSRTC) categories IV, followed by V and III, whereas category VI is infrequent.

The aim of our study was to identify distinct cytomorphological characteristics in ambiguous cases that might be suggestive of NIFTP.

**Methods:** We present 6 cases of histologically confirmed NIFTP, which were examined preoperatively by ultrasound (US) guided FNAB. By cytology 3 cases were reported as TBSRTC category V (suspicious for papillary carcinoma, follicular variant), 2 cases as III (1

atypia of undetermined significance and 1 follicular lesion of undetermined significance) and 1 case as IV (follicular neoplasm). Five patients were women and 1 man; the age ranged between 15–50 years. By US all cases shared similar characteristics; solitary nodules, well circumscribed, isoechoic, or slightly hypoechoic, solid, with peripheral or mixed type of vascularity.

**Results:** The cytomorphological characteristics detected in all cases were: nuclear enlargement, nuclear crowding and/or overlapping, and nuclear grooves. Nuclear clearing was heterogeneous among cases and even among cells of the same case. Nuclear clearing and nuclear grooves were more prominent in cases classified as category V. True papillae or papillary like structures, psammoma bodies and nuclear pseudoinclusions were absent in all cases. Multinucleated giant cells were present in two cases.

**Conclusions:** Certain cytomorphological features under the appropriate clinical and US settings might be suggestive of NIFTP. Thus, an explanatory comment should be included in the cytology report, in order to avoid unnecessary radical surgical procedures.

## P5-25 | Warthin-Like Papillary Carcinoma of the Thyroid: Diagnosis by Fine-Needle Aspiration

C. López

*HGU Gregorio Marañón, Madrid, Spain*

**Objetives:** Papillry carcinoma is the most common malignant neoplasm of the thyroid. Warthin-like is an incommon variant that was first described in 1995 by Apel et al. With clinical course and prognosis similar to the usual variant of papillary thyroid carcinoma (PTC) and with distinctive cytological features.

**Methods:** We present the case of a 59 year old woman with history of hypothyroidism. In a thyroid ultrasound of control, signs of thyroiditis and a well defined right lobe nodule, with vascularization and calcification are observed.

Fine needle aspiration cytology is performed.

**Results:** Stained cytologic smears revealed three-dimensional or syncitial clusters of oncocytic-like cell with moderate to abundant amphophilic or eosinophilic granular cytoplasm, nuclear overlapping, uniform chromatin, anisonucleosis and nucleomegaly in a background showing a significant number of lymphocytes and scanty thick colloid.

Some intranuclear pseudoinclusions and occasional grooves were observed. With siderophages and multinucleated giant cells.

Cytological diagnosis was of variant warthin like of the papillary thyroid carcinoma.

**Conclusions:** The differential diagnosis in cytology includes neoplastic or non-neoplastic thyroid lesions, which contain Hürthle cells and lymphocytic infiltrate.

The diagnosis depends on a careful search for nuclear features of papillary carcinoma and not to consider the lymphoid infiltrate in the background as lymphocytic thyroidits, which may give rise to false negative diagnosis.

Epitelial cells with combined features of PTC and Hürthle cells arraged in tree-dimensional clusters with intermingling lymphocytes suggests the diagnosis.

We believe that this variant should be indicated in pathology reports because the prognosis is favorable in relation to other variants of PTC.

## P5-26 | Thyroid Fna Aus/Flus Category: Cyto-Histological Correlation

R. Huhtamella[1,2]; I. Kholová[1,2]

*[1]Pathology, Faculty of Medicine and Life Sciences, University of Tampere, Tampere, Finland; [2]Pathology, Fimlab Laboratories, Tampere, Finland*

**Objectives:** Thyroid Bethesda Classification introduced new AUS/FLUS category that is heterogenous and its routine use is a bit controversial. We analyzed all AUS/FLUS cases from 2013–2016, their cytology subclassification and cyto-histological correlation when available.

**Methods:** The study cohort included all AUS/FLUS thyroid results from the period 1.10.2013–31.12.2016. The total amount of AUS/FLUS cases was 343 from 259 patients. The mean age was 58.7 years and there were 202 females and 57 males.

**Results:** Out of 259 patients, 119 (45.9%) were operated on. Sixty-nine were operated after first AUS/FLUS diagnosis, 46 after 2 AUS/FLUS diagnoses and 4 after 3 AUS/FLUS diagnoses. There were 35 (13.5%) malignancies in total and 47 benign tumors. Repeated AUS/FLUS was diagnosed in 76 (29.3%) cases.

**Conclusions:** The risk of malignancy for AUS/FLUS (13.5%) is in agreement with original Bethesda risk of malignancy.

## P5-27 | Implementation of Molecular Studies by High Resolution Melting in Gray Areas of the Bethesda Classification for Thyroid Fine Needle Aspiration in a Hospital of Argentina

N. Tolaba; P. Bazzoni; C. M. Moya; M. Nallar; M. Monteros-Alvi

*Hospital of Endocrinology and Metabolism "Dr. Arturo Oñativia", Salta, Argentina*

**Objectives:** To estimate the sensitivity and specificity of the High Resolution Melting (HRM) technique for the molecular studies performed on thyroid Fine-needle aspiration (FNA) samples carried out in the period from November 2014 to May 2017. To correlate these results with cytological and histological studies of the same patients.

**Methods:** We prospectively analyzed 118 thyroid FNA samples of wich 88 were diagnosed according to the Bethesda classification in categories BIII, BIV and BV corresponded to the gray area. The 7 most frequent genetic alterations in differentiated thyroid cancer

were studied: mutations in BRAF, K/H/N-RAS genes and RET/PTC 1 and 3, and PAX8/PPARG gene fusions. The diagnosis was made by HRM. Also, commercial kits and sequencing were used to validate HRM results. Gene fusions were diagnosed by Real Time-nested PCR.

**Results:** Of the 88, thyroid FNA corresponding to the gray area, 20 has a mutation in 1 of the 7 genes analysed. 42 samples were histologically confirmed after surgery and 16 were positive for 1 of these mutations. Histological analysis confirmed the presence of neoplasms in all positive samples however, 11 were carcinomas and 5 adenomas (PPV 68.7%). All positive BRAF mutations were papillary carcinoma. About 5 NRAS and KRAS positive samples were follicular carcinomas or adenomas. Fusion genes, RET/PTC1 was a follicular variant papillary carcinoma and PAX8/PPARG were follicular adenomas and carcinomas. The samples analyzed by HRM allowed us to estimate a sensitivity of 100%, a specificity of 83% and the diagnostic accuracy of 88%.

**Conclusions:** The results confirm the high sensitivity and specificity of molecular studies. In addition, the results of the molecular techniques designed, had a 100% concordance with commercial kits and sequencing analysis. This methodology allowed to improve the preoperative diagnostic accuracy, contributes to risk stratification and helps selecting the appropriate surgery.

## P5-28 | Development and Characterization of Low Allelic Frequency, Multigene Molecular Cytopathology Cell Slides as a Potential Fine Needle Aspirate (Fna)-Mimetic Reference Material

G. Roma; Q. Zheng; S. Setoodeh; A. Hilmer; S. Saddar
*AccuRef Diagnostics, Milpitas, CA, USA*

**Objectives:** As we enter an era of precision tumour profiling there is a significant need for molecular reference standards that can be employed for assay development, quality assurance, and proficiency panels in order to validate assay performance, and understand cross-site and inter-operator variability. Due to low quantities of specimen, it is particularly difficult to source well-characterized, fine needle aspirate (FNA) samples for molecular cytopathology. Engineered cell-line based reference standards are ideal for this application, since they represent a biologically-relevant, reproducible, and renewable source of control materials. We developed a cytopathology panel with the goal of mimicking low allelic frequency in clinical FNA samples.

**Methods:** CRISPR/Cas9 technology was used to engineer the EGFR E746-A750del, EGFR T790M, and KRAS G13D mutations from a parental cell line (RKO). The cell lines were mixed to prepare four separate cytopathology slides, containing all three mutations at mutant allele fractions of 0% (wild-type), 1%, 5%, and 10%. Mixed cells were ethanol-fixed and deposited onto slides by CytoSpin™ centrifugation at approximately 200 000 cells per slide. The deposition process was optimized to allow for Kwik-Diff™ staining, with minimal cell detachment, and enable subsequent DNA extraction and analysis. Inter- and intra- slide cell distribution consistency was assessed by analysing digital images of stained slides. Genomic DNA extraction efficiency post- Kwik-Diff™ staining was also assessed. For MAF analysis, genomic DNA (gDNA) was validated by digital PCR.

**Results:** We obtained homogeneous distribution of the cells on glass slide using the CytoSpin™ apparatus. The coverage area is ~10%, when 200 000 cells are loaded. All cell slides consistently contained 200 000±40 000 cells.

**Conclusions:** CRISPR/Cas9-engineered cell lines provide a renewable, biorelevant source of molecular reference standards. These engineered lines can be reproducibly incorporated into cell-based cytopathology slides, and provide a valuable alternative to clinical samples, particularly for difficult to source oncogenic variants.

## P5-29 | Diagnostic Implication of Cytologic Atypia/Architectural Atypia Subcategorization of Indeterminate Thyroid Nodules (Bethesda-III) with Ras Mutations Subtype and Clinical Outcomes

I. Laklouk; C. Ponchiardi; S. Cerda
*Boston University Medical Centre, Boston, USA*

**Objectives:** To assess implication of subcategorization of indeterminate thyroid nodules (Bethesda-III) as cytologic atypia (CA) or architectural atypia (AA) with RAS mutations subtype and surgical pathology outcome prediction.

**Methods:** A prospective cross-sectional study including 270 thyroid nodules with Bethesda-III cytology and corresponding ThyroSeq molecular testing (2015–2017). Bethesda-III cytology diagnosis was subcategorised into nodules with either cytologic atypia (CA) or architectural atypia (AA). RAS mutations present were HRAS, KRAS, and NRAS. The surgical pathology outcome of matched resected nodules was neoplastic nodules (Follicular Variant Papillary Thyroid Carcinoma; Non-invasive Follicular Thyroid Neoplasm with Papillary-like Nuclear Features; Classic Papillary Thyroid Carcinoma; Adenomas) and non-neoplastic nodules (hyperplastic nodules). Odds ratio (OR) was used as a measure of association with a significant level at $p < 0.05$.

**Results:** Of 76 Bethesda III resected nodules, 35 expressed RAS mutations; 23 (66%) with CA and 12 (34%) with AA. RAS mutations were distributed as follows: NRAS 66%, HRAS 17%, KRAS 17%. KRAS mutation was associated with a higher neoplastic lesion outcome (66.7%) when compared with NRAS (52.2%) and HRAS (50.0%) mutations, but were not significant predictors for neoplastic lesions in Bethesda III nodules ($p = 0.8$). Adjusted to RAS mutations subtype, CA nodules had higher probability to have neoplastic

outcome compared with AA nodules, OR = 4.0 (p = 0.07). In NRAS positive nodules the prevalence of neoplastic lesions was higher in CA nodules compare to AA nodules; OR = 6.0 (p = 0.049). In KRAS and HRAS positive nodules, no difference was observed in the rate of neoplastic lesions in CA nodules compared with AA nodules.

**Conclusions:** Our results suggest that Bethesda-III cytology subcategorization into nodules with CA or AA improves the accuracy of classification and prediction of neoplastic lesions with NRAS mutation with borderline statistically significance. However, Bethesda-III cytology subcategorization has no significant impact in predicting neoplastic lesions with KRAS and HRAS mutations.

## P5-30 | The Influence of Rapid On-Site Evaluation by Fine-Needle Aspiration in Adequacy and Precision of Thyroid Nodules Cytological Diagnosis

O. Gibert; F. García; M. L. Surrallés; X. Morlius; L. García; R. Albero; P. Forcada; C. González; L. García-Pascual; X. Tarroch

*Hospital Universitari Mútua Terrassa*

**Objectives:** Non-diagnostic or inadequate specimen, classified as Bethesda I, is the most important limitation of thyroid ultrasound-guided fine-needle aspiration (US-FNA). This study aimed to determine the influence of the rapid on-site evaluation (ROSE) by cytotechnologists in terms of the adequacy and precision of thyroid nodules cytological diagnosis.

**Methods:** Consecutive thyroid US-FNA (679 specimens), performed over 2-year period (2016–2017), were retrospectively included. These were obtained from 519 patients (84% females). An experienced cytotechnologist performed an immediate on-site evaluation of adequacy in 387 US-FNA of specimens. In the remaining 292 samples, US-FNA were practiced without ROSE. Cyto-histological correlation was possible in 94 surgical cases. We compared results with ROSE against results without this procedure.

**Results:** Cytological adequacy was higher with the performance of ROSE (18.6% inadequate specimens) than without it (52.4% inadequate specimens). In the Non-ROSE US-FNA group (36 cases), the risk of histological malignancy according to cytological diagnosis was: Bethesda I, 1/4 (25%); Bethesda II, 2/13 (15.4%); Bethesda III, 2/8 (25%); Bethesda IV, 3/3 (100%); Bethesda V, 5/5 (100%); Bethesda VI, 3/3 (100%). In the US-FNA group with ROSE (58 cases), the risk of malignancy was normalized in all diagnostic categories: Bethesda I, 0/3 (0%); Bethesda II, 1/13 (7.7%); Bethesda III, 5/27 (18.5%); Bethesda IV, 1/7 (14.3%); Bethesda V, 3/5 (60%); Bethesda VI, 3/3 (100%). Overall, 14 incidental papillary microcarcinomas were detected.

**Conclusions:** The use of ROSE procedure in the diagnosis of thyroid lesions improves the adequacy of the samples, reducing significantly non-diagnostic cases. In spite of the limited number of patients in our series, it seems ROSE also provides a more precise cytological diagnosis by improving the cytohistological correlation.

## P5-31 | Importance of Guided Fine Needle Aspiration Cytology for the Diagnostic of Thyroid Nodules and Histologic Correlation. A 5-year Experience

O. B. Popescu; P. López-Ferrer; A. M. Rodriguez; S. Hernández Bonilla; I. De la Peña; B. Vicandi

*Hospital Universitario La Paz, Madrid, Spain*

**Objectives:** USG-guided fine needle aspiration (FNA) of the thyroid has been accepted as a first-line screening for patients with thyroid nodules. The main role of FNA is to triage patients for either surgery or conservative management.

**Methods:** Patient cytology and biopsy data were retrieved by a retrospective search of all thyroid fine needle aspiration cytology and thyroid biopsy from the archives of Hospital Universitario La Paz from January 2013 to December 2017. The cytological results were classified as: benign and cystic lesions (Bethesda I and II); positive for malignancy (Bethesda V and VI); indeterminate lesions/follicular lesions (follicular pattern nodules, follicular proliferation, Hurthle cells lesions) (Bethesda III and IV) and unsatisfactory (Bethesda I). The histologic correlation was made and the discrepancies were evaluated.

**Results:** In total 5345 thyroid FNA specimens from 3816 patients were reviewed. The distribution of cytologic diagnosis was as follows: 3661 benign (68.49%), 253 malignant (4.73%), 909 follicular lesions (17%) and 522 unsatisfactory (9.76%). 620 patients (16.24%) had surgical follow-up. The cytological diagnosis which had histologic correlation were classified as: 284 benign, 185 malignant, 212 follicular lesions and 11 unsatisfactory.

**Conclusions:** Our diagnostic categories of thyroid cytology are very useful for triaging patients with thyroid nodules for clinical management. There are operator-dependent factors such as the selection of suspicious nodules for aspiration and skill in achieving diagnostic material. At the same time the presence of the cytopathologist is very important in reducing the number of nondiagnostic cases.

## P5-32 | Rate of Malignancy in Thyroid Nodules Classified as AUS/FLUS (TBSRTC III) in a Tertiary Care Center in India

H. Sarin; A. Thakur; A. Mithal; D. Sarin

*Medanta the Medicity, Gurgaon, India*

**Objectives:** To evaluate the risk of malignancy in thyroid nodules categorized as AUS/FLUS (TBSRTC III) on FNAC.

**Methods:** A retrospective audit of all thyroid FNAs at a tertiary care center between January 2014 and December 2017 was done. The percentage of AUS/FLUS was calculated. The rate of malignancy was calculated for patients where final histology was available. NIFTP were excluded from malignant classification after January 2017.

**Results:** The total number of thyroid FNACs reported was 1326. AUS/FLUS was reported in 100 patients (7.5%). Histopathology was available in 42 cases. Rate of malignancy was 33.3%. The commest cancer was Follicular variant of papillary carcinoma.

**Conclusion:** In high volume centers the percentage of AUS/FLUS reported concurs with prescribed norms. Risk of Malignancy in this category exceeds the predictive rates published by the TBSRTC. However, a bias favoring a higher ROM cannot be excluded as only some patients in the AUS/FLUS category underwent surgery.

## P5-33 | Cytohistological Correlation in Thyroid Cytopathology – A Single Center Experience

P. Luís; S. Ortiz; I. Andrade
*Pathology Department, Hospital Distrital de Santarem, Portugal*

**Objectives:** Fine needle aspiration cytology (FNAC) of thyroid gland is still an important tool in evaluating patients with thyroid nodules. In literature the concordance rate of the different Bethesda cathegories and the findings in histological specimens varies greatly. Our goal was to evaluate the CR of the different Bethesda categories in our experience, and to review the discordant cases.

**Methods:** From 2009 to 2017, 3035 FNAC of thyroid gland were performed, of these 290 patients were submitted to thyroid gland surgical resection (lobectomy or total thyroidectomy). Cytology was compared to the surgical resection diagnosis, to determine the correlation rate (CR). Discordant cases were reviewed.

**Results:** 27(9%) were diagnosed as Bethesda I in cytology - 3 revealed in histological specimen papillary carcinomas. 100(34%) were diagnosed as Bethesda II in cytology - 4 revealed in histological specimen papillary carcinoma (CR 97% – malignancy risk 4%). 69 (24%) were diagnosed as Bethesda III in cytology – 29 were benign nodules, 19 were follicular adenomas on histology, 2 follicular carcinomas, 12 papillary carcinoma (malignancy risk 15%). 67(23%) were diagnosed as Bethesda IV in cytology – 25 revealed in histological specimen benign nodules, 9 papillary carcinomas, 1 medullary carcinoma (CR 48% – malignancy risk 24%). 18(6%) were diagnosed as Bethesda V in cytology – 5 revealed in histological specimen benign nodules (CR 66% – malignancy risk 66%). 9(3%) were diagnosed as Bethesda VI in cytology – 1 revealed in histological specimen a benign nodule and 1 a follicular adenoma (CR 78% – malignancy risk 78%).

**Conclusions:** Our results are similar to the reported in literature. The major diagnostic problems encountered in cytology were undersampling and overinterpretation of artefacts. Some cases, after discussion and review of the histological specimen, were reassigned a different Bethesda cathegory. The analysis of discrepant cases led to a better CR.

## P5-34 | Metastatic Thyroid Nodules. Fine Needle Aspiration Cytology of Metastatic Squamous Cell Carcinoma: Case Report and Literature Review

J. Martín López; G. Yange Zambrano; J. B. García Reyero; J. Martínez-Echevarría Gil-Delgado; M. Martino González; M. A. Revuelta González; M. L. Cagigal Cobo
*Hospital Universitario Marqués de Valdecilla, Santander, Cantabria, Spain*

**Objectives:** Metastasis to the thyroid gland is uncommon and include carcinomas of kidney, breast, pancreas, colon, ovary, lung and head and neck region; and malignant melanoma. Although Squamous Cell Carcinomas (SCC) are readily identified on aspiration cytology in the majority of cases, the differentiation of primary vs. metastatic tumour might not always be easy. The Papanicolau Society of Cytology (PSC) provides a standarized nomenclature in the field of Thyroid Cytology classifying the metastatic SCC as malignant (Category VI).

**Method:** Fine needle aspiration cytology (FNAC) was performed in one patient with a thyroid nodule. Smears were stained with Diff-Quik and Papanicolaou stains. We report the case of a metastatic SCC and review the literature regarding the frequency of metastasis to the thyroid.

**Results:** A 69 year old man with SCC previously diagnosed in the oral cavity one year ago present a single isthmus nodule with multiple laterocervical and one mediastinal lymph node. The thyroid ultrasound examination was considered hypoechoic with suspicious of malignancy. FNAC was performed and demonstrates malignant cells with epithelioid morphology in a necrotic background. The cells showed cytological features of SCC including keratinization and orangeophilic cytoplasms. With the clinical correlation the lesion was categorized as metastatic SCC. The patient is under chemotherapy treatment with carboplatin, tegafur and cetuximab.

**Conclusion:** Malignancies metastasizing to the thyroid account for 0.1% of all thyroid nodular lesions investigated by FNAC. FNAC is a rapid, accurate, and minimally invasive procedure that is useful in the diagnosis. Metastatic SCC usually presents in the setting of widespread malignancy, therefore a dedicated clinical and radiological investigation is necessary in these cases.

## P5-35 | Metastatic Neoplasms to the Thyroid Diagnosed by Fine-Needle Aspiration

M. S. Carmona; M. C. Gómez-Mateo; J. W. Comba-Miranda; M. Rezola-Bagineta
*Hospital Universitario Donostia*

**Objetives:** Secondary tumours of the thyroid gland are tumours that arise in the thyroid gland by direct extension from adjacent structures or by vascular spread from non-thyroidal sites. The frequency of metastasis is <0.2% of thyroid malignancies. Thyroid metastases are more common in females, with a female to male ratio of 1.2: 1, and tend to occur with advancing age. Although thyroid fine-needle aspiration (FNA) is commonly utilized modality in the evaluation of thyroid nodules, metastatic tumors to the thyroid are only rarely encountered. We try to determinated the incidence and primary origin of metastases to the thyroid at our institution and to examine their clinicopathologic features.

**Methods:** We did a search of our database to review all thyroid FNA examined in Hospital Universitario Donostia between January 2000 and January 2018, and that these include the diagnostic category V or VI of the Bethesda system for reporting thyroid cytopathology.

**Results:** A total of 5403 FNA were performed during these period, 84 incluide the diagnostic category V or VI of the Bethesda, and 2.3% of these FNA were positive for metastatic lesiones (2 cases). One case was 29 years old woman and the origen primary neoplasm was the breast, the interval from diagnosis of primary tumour to the detection of thyroid metastasis was six years. Another case was 72 years old man with cancer unknown primary origin, patient has metastatic disease elsewhere at the time of presentation. Both cases were confirmed by immunohistochemical examinations.

**Conclusions:** Thyroid metastases are uncommon but can be detected more frequently with routine use of FNA. They are most often caused by tumours of the kidneys, lungs, mammary glands, ovary, and colon or by melanomas. They usually occur when there are metastases elsewhere, sometimes many years after the diagnosis of the original primary tumour. Metastases to the thyroid diagnosed by FNA are exceedingly rare in our institution, comprising only 0.03% of total FNA and only 2.3% of all thyroid neoplasms. FNA could be helpful in the diagnosis of thyroid metastatic lesion, with adequate sample and ancillary technical such as immunohistochemistry.

## P5-36 | Primary Malt Lymphoma of the Thyroid – A Challenging Diagnosis in Fine Needle Aspiration Cytology

P. Luís; S. Ortiz; I. Andrade
*Pathology Department, Hospital Distrital de Santarem, Portugal*

**Objectives:** Thyroid lymphomas comprises about 4–5% of thyroid malignancies; they usually arise in a background of Hashimoto thyroiditis or lymphocytic thyroiditis and most are diffuse large B cell lymphoma. Diagnosing lymphoma in fine needle aspiration (FNAC) can be extremely difficult and sometimes impossible.

**Methods:** The authors present a case of a 65 year-old female, that presented with multiple thyroid nodules, with recent enlargement. Thyroid function was normal. A FNAC was performed in the larger nodule.

**Results:** The smears were hypercelular, with abundant oncocytic cells, without atypia, in a background of abundant lymphoid cells. The lymphoid population was heterogeneous, but there was a predominance of medium cells with some nuclear irregularities, and some larger cells with multiple nucleoli; there were rare lymphoid aggregates and very rare macrophages. Final FNAC diagnosis was atypia of undeterminate significance – atypical lymphoid cells (Bethesda Cathegory III), in a background of Hashimoto's thyroiditis. Because there was a clinical and imagiological suspicion of a follicular malignancy, a thyroidectomy was performed. Histological examination revealed a MALT lymphoma, in a background of nodular Hashimoto's thyroiditis.

**Conclusions:** Thyroid lymphoma diagnosis by FNAC can be quite difficult, and nearly impossible in a background of thyroiditis. In our case a flow cytometry could have been diagnostic, but with the clinical and imagiological impression of a follicular tumour and the rarity of a primitive thyroid lymphoma, a surgical approach was preferred.

## P5-37 | Cytologic Diagnosis of Anaplastic Thyroid Carcinoma. A Case Report

J. Apaza[1]; C. Rodriguez[1]; M. Velasquez[1]; S. Moreno[1]; F. Lozano[1]; S. Gonzalez[1]; M. Garcia[1]; E. Colgmena[1]; J. Rodriguez-Costa[2]
*[1]Physician resident at the Gregorio Marañón University Hospital in Madrid; [2]Physician assistant at the Gregorio Marañón University Hospital in Madrid*

**Objectives:** Anaplastic thyroid carcinoma (ATC), accounts for less than 5% of thyroid carcinomas and is the most aggressive thyroid epithelial neoplasm. Three histological patterns are identified and frequently coexist: spindle cells, giant cells and squamoid cells. The aim of this study is to describe the cytologic features of ATC and to recognize the importance of cytologic diagnosis of this entity.

**Methods:** We report the case of a 76-year-old female patient with a history of goiter and hypothyroidism, presented to the hospital with swelling in the right side of the neck since last three weeks, which was associated with pain and significant loss of weight. The last week the patient developed dyspnea, difficulty in swallowing and coughing. On examination a hard and fixed nodule was noted in the right thyroid lobe, which measures 7 cm diameter. Computed tomography (CT) revealed a heterogeneous mass of 4.8×4.3×7 cm in the right lobe of thyroid gland with calcifications, as well as significant compression of the trachea. Pulmonary CT shows multiple round nodules of varying sizes in both lungs, consistent with

metastases. Fine needle aspiration cytology (FNAC) from thyroid nodule was performed.

**Results:** The smears from the thyroid nodule showed marked pleomorfic giant cells arranged in clusters, cells nuclei was enlarged and variable in shape, with coarse chromatin and prominent nucleolus. Given the extent and severity of the disease, it was not possible to perform the histological study. Palliative care services were initiated and the patient expired one month later.

**Conclusions:** Although we do not have histological confirmation, we consider that cytological description of this rare neoplasm is of interest to pathologists, since due to its peculiar characteristics it is possible to make a cytological diagnosis of the disease with high probability of success.

## P5-38 | The Cytologic Findings of IGG4-Related Thyroiditis: An Important Mimicker of papillary thyroid carcinoma

Y. Chong; Y. S. Lee; E. J. Lee

*College of Medicine, The Catholic University of Korea, Seoul, Republic of Korea*

Immunoglobulin G4-related thyroiditis (IgG4-RT) is an emerging new disease entity characterized by fibrosing lymphoplasmacytic inflammation of the thyroid, rich in IgG4-positive plasma cells. Clinically, IgG4-RT often presents as a mass forming lesion which can mimic neoplasm. Cytologically, low cellularity due to extensive fibrosis and nuclear atypia of follicular cells can often mislead overdiagnosis. Although a few cases have been reported in the literature, the cytologic findings were not described. Here we report a case of IgG4-RT with highlighted cytologic findings and the review of similar diseases such as Riedel's thyroiditis and the fibrosing variant of Hashimoto's thyroiditis.

## P5-39 | Use of VE1 Immunostaining on FNA of Papillary Thyroid Carcinoma

Y.-D. Choi; C.-S. Park; J.-H. Nam; G.-E. Kim; S.-S. Kim

*Chonnam National University Medical School, Gwangju, Republic of Korea*

**Objectives:** BRAF mutation is identified in approximately 50% of all papillary thyroid carcinomas (PTCs). The anti-BRAF antibody VE1 immunohistochemical (IHC) stain is widely useful, but almost has been validated in surgical specimens. Fine-needle aspiration (FNA) is widely used as a diagnostic tool for risk stratification of thyroid nodules. Therefore, we evaluated the performance of VE1 immunostaining on thyroid FNA for cytologic diagnosis of PTC.

**Methods:** We identified 29 FNA specimens using ThinPrep liquid cytology. The cytologic diagnosis was 16 cases of atypia of uncertain signficance (AUS) and 13 of suspicious of PTC. VE1 immunostaining and BRAF mutation test were performed in all cases. Subsequent surgery was also performed in all cases.

**Results:** The diagnosis of surgical biopsy was 18 cases of PTC and 11 cases of benign nodular hyperplasia (BNH). On cytology, the 18 cases of PTC were diagnosed as AUS (5 cases) or suspicious for PTC (13 cases). All 11 cases of BNH was diagnosed as AUS. The disconcordant rate between VE1 immunostaining and BRAF mutation of FNA cytology specimen was 20.7% (6/29). But, limitation to interpretation of VE1 immunostaining included low cellularity and obscuring blood, macrophages, or colloid. Of disconcordant cases, 4 cases were positive on VE1 immunostaining, but negative on BRAF mutation test. These cases were diagnosed as 3 cases of PTC and 1 case of BNH. The remaining 2 cases were negative on VE1, but positive on BRAF mutation. These cases were PTC on surgical biopsy. The positive predictive value was 50% on BRAF mutation test and 55.6% on VE1 immuostaining. It increase to 66.7% by combination of VE1 immunostaining and BRAF mutation test.

**Conclusions:** VE1 immunostaining can be applied to thyroid FNAs to increase the positive predictive value and potentially improve the risk stratification of indeterminate thyroid nodules.

## P5-40 | A Series of Metastatic Tumors to the Thyroid Diagnosed by Fine-Needle Aspiration Cytology (FNAC)

A. Uguz[1]; K. Erdogan[1]; E. Bagir[1]; S. Canberk[2,4]; P. Firat[3,5]

*[1]Cukurova University, Adana, Turkey; [2]Acibadem University, Istanbul, Turkey; [3]Istanbul University, Istanbul, Turkey; [4]University of Porto, Porto, Portugal; [5]Koc University, Istanbul, Turkey*

**Objectives:** The thyroid gland is a rare site for metastatic tumors. A new thyroid mass in a patient with a history of malignancy should be considered metastatic disease until proven otherwise. The aim of this study is to define striking cytologic features of some metastatic tumors to the thyroid gland.

**Methods:** Fourteen patients which were interpreted as metastatic tumors to thyroid by FNAC were collected from three different institutions.

**Results:** The primary sites of metastatic neoplasms were such as; 4 lung adenocarcinomas, 2 colon carcinomas, 2 plasmacytoma, 1 renal cell carcinoma, 1 mixed germ cell tumor, 1 breast carcinoma, 1 adenoid cystic carcinoma, 1 neuroendocrine tumor, 1 malignant melanoma.

**Conclusions:** Cytological features of metastatic tumors overlap with primary thyroid tumors especially in small tumor nodules. Although, well differentiated malignant cells show primary tumors' striking features, poorly differentiated tumors are challenging in cytologic examination. The adequate tumor sampling is essential to avoid pitfalls because of the limitations of FNAC in the diagnosis of undifferentiated metastatic malignancies.

## P5-41 | Study of the Molecular Alterations of papillary thyroid carcinoma and Its Possible Role on Fine-Needle Aspiration

I. Sánchez Güerri; M. Salido; S. Clavé; L. Díaz; A. Dalmases; M. Renard; C. Fernández; L. Fernández; M. T. Rodrigo; B. Bellosillo; B. Lloveras
*Parc de Salut Mar, Barcelona, Spain*

Fine-needle cytology is considered the best test to detect papillary thyroid carcinomas(PTC). Nevertheless, a small proportion of cases, diagnosed as "*follicular lesion/atypia of undeterminated significance*" (Bethesda III) may benefit from molecular tests for a better management. Clonal genetic alterations causing the activation of MAPK pathway (*BRAF* and *RAS* mutations or *NTRK1* and *RET* chromosomal rearrangements) are responsible for up to 70% of PTC.

The aim of this project was first to study the status of *BRAF*, *RAS*, *RET* and *NTRK1* on 33 PTC nodules (>1 cm), including 10 consecutive follicular variant PTC (fvPTC) and 23 randomly selected classic PTC (cPTC) and to explore the possible role of molecular techniques in corresponding FNA. *BRAF* and *RAS* mutation analysis were performed by next-generation sequencing (NGS) and *RET* and *NTRK1* chromosomal rearrangements were tested with break–apart FISH probes. *RET* fusion partners were determined by NGS.

Overall, 84% (28/33) of the cases were diagnosed with FNA. Bethesda V-VI cytology diagnosis categories represented 89% (25/28) and corresponded to cPTC or fvPTC on histological examination. Nineteen (58%) PTC harbored one driver-gene mutation. *BRAF* was mutated on 43% cPTC (10/23) and 20% fvPTC (2/10). *RAS* mutations (1 *NRAS* and 1 *KRAS*) were only detected in fvPTC (2/10; 20%). *RET/PTC* fusions were detected in 17% of cPTC (4/23) and 10% of fvPTC (1/10). *PTC1* and *PTC3* genes were identified as *RET* fusion partners. No *NTRK1* rearrangements were detected. In 2 cases (7%) the FNA was categorized as Bethesda III and both corresponded to cPTC (one with a RET rearrangement).

We confirm that in the diagnosis of PTC cytology is a very good tool. Molecular tests to detect the most frequent genetic alterations (BRAF, RAS and RET) is feasible and can be useful in some Bethesda indeterminate diagnosis.

## P5-42 | Quality Assurance in Thyroid Fine-Needle Aspiration

M. Benach; I. Soler; I. Sanchez; A. Quiñonero; E. Romero; I. Vazquez; L. Pijuan; B. Lloveras
*Pathology Department, Hospital del Mar, Universitat Autònoma de Barcelona, Barcelona, Spain*

**Introduction:** The Bethesda system (BS) for Thyroid Fine needle aspiration is reccommended to classify the cytological results. Advantages from its use include standardization and clinical guidelines. It is also a good tool for evaluating peformance of a Cytology team. The objective of this study is to evaluate our thyroid FNA series during the years 2015–2016.

**Methods:** During these years, 628 thyroid FNAs from 520 patients were received, 75% from women and 25% from men (ratio 3/1). Mean age was 56 years (17 to 86 years). Histological results were collected and correlation with cytological results was performed. The discordant cases were reviewed in QC sessions.

**Results:** Results according to BS were as follows: 121 (19.26%) I, 336 (53.50%) II, 92 (14.65%) III, 42 (6.68%) IV, 8 (1.27%) V and 29 (4.61%) VI. In 17% cytohistological correlation was possible. Rate of malignancy among surgically treated patients was 0% in BS I, 13% in BS II, 13% in BS III, 8% in BS IV, 66% in BS V and 100% in BS VI. The amount of samples BS I (insuffiecient) was diferent according to the department of origin and was lower when rapid evaluation was performed.

**Conclusions:** Quality control of thyroid FNA is simple when using BS. Yearly quality assurance allows to learn from errors and therefore to improve the performance of the Cytology team.

# P6 MOLECULAR AND IMMUNOCYTOCHEMISTRY

## P6-1 | Adequacy of Ebus-Tbna Specimens for Mutational Analysis in Metastatic Non-Small Cell Lung Carcinomas

Q. Gan; N. Caraway; S. R. Chowdhuri; M. Mehrotra; J. Stewart; E. Valik; G. Eapen
*The University of Texas MD Anderson Cancer Center*

**Objective:** In this molecular era of lung cancer management, it is imperative to obtain sufficient material for mutational analysis. Small biopsies may be the only source of material for analysis, especially in patients with advanced disease. This study investigates utility of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) to obtain adequate material for mutational analysis in metastatic non-small cell lung carcinoma (NSCLC).

**Methods:** The institutional pathology database was searched for metastatic NSCLC cases with molecular requests obtained by EBUS-TBNA from 1/1/2015 to 12/31/2015, following IRB approval. The patient demographic data as well as specimen parameters such as tumor fraction, DNA yield, and molecular test results were collected and analyzed. Mutational analysis was performed by next generation sequencing (NGS) or single gene analysis (Sanger sequencing and/or pyrosequencing) and/or fluorescence in-situ hybridization (FISH).

**Results:** Mutational analysis was requested on 56 (37%) of the 152 metastatic NSCLC cases obtained by EBUS-TBNA. Of these 56 cases, 50 (89%) (43 adenocarcinomas, 5 NSCLC, not otherwise specified, & 2 squamous cell carcinomas) had adequate material (smears and/or cell block sections), while requests were cancelled in 6 of 58 (10.3%) cases due to insufficient tumor present. The

tumor fraction of the cases with molecular results ranged from 20–90%. The mean of DNA yield was 262 μg and the median DNA yield was 157 μg (range, 5.6 to 4500 ng). Out of the 50 cases, 41 (78.8%) had positive genetic alterations and included 17 different genes. There were 12 cases with mutations that had approved or off-label targeted therapy including *EGFR*, *BRAF*, *ALK*, *MET*, and *PTEN*, and 20 cases with mutations that have either therapeutic or predictive implications.

**Conclusions:** EBUS-TBNA specimens can provide sufficient material for mutational analysis in majority of metastatic NSCLC patients to detect genetic alterations with therapeutic, prognostic, and predictive implications.

## P6-2 | Immunohistochemical Typing of Neoplasms on Cell Block of Fine Needle Aspiration Cytology – Experience From Tertiary Cancer Centre

A. Nargund; S. Balu; A. Patil; M. Malathi
*Kidwai Cancer Institute, Bengaluru, Karnataka, India*

**Objectives:** Fine needle aspiration cytology (FNAC) and cell block have gained popularity because they are rapid, cost effective, minimally invasive and reliable method for diagnosis of any lesions. Immunohistochemistry (IHC) on cell block can be used to categorize these neoplasms. It is suitable in debilitated patients, multiple lesions and easily repeatable compared to biopsy procedure. The objective of this study was to evaluate the effectiveness of IHC in categorizing the neoplasms diagnosed on FNAC smears.

**Materials and Methods:** Present study was done in Cytology division, Department of Pathology, Kidwai Cancer Institute, Bengaluru from Jan to Dec 2013 .133 cases were analysed by FNAC, Cell block, IHC. For deep seated lesions, FNAC was performed under Ultrasonography. Smears were made for MGG and PAP stain. Cell block was prepared by formalin/Agar method. Final diagnosis was offered by correlating clinical & radiologic findings.

**Results:** Total of 133 cases were studied. IHC on cell block was done for definitive diagnosis. The age ranged from 7 months to 76 years, 79 were males and 54 were females. These included Hepatobiliary, 37 cases; Lymph node,7; renal, 12; Mediastinal mas,11; Lung,16; Abdominal lesions,13;GIT,6; Bone & soft tissue, 20; Endocrine, 5. Liver was the commonest site, constituting 27% of all aspirations. Diagnosis ranged from Hepatocellular carcinoma, GIST, renal cell carcinoma to ES/PNET .6 cases were inconclusive on IHC and only morphological diagnosis was rendered .For the accuracy of the results, cases were correlated with the histopathological & cytogenetic findings.

**Conclusion:** USG guided FNAC can be performed in patients of almost any extreme of age group without much risk of complications. Correlating clinical, radiologic findings a confident diagnosis of primary or metastatic neoplasms can be established by FNAC, Cell block and IHC. Cell block can also be studied for further ancillary studies.

## P6-3 | Comparison of PDL1 Expression on Cytology Cell Blocks and Biopsy Samples from Lung Cancer. A Study of 13 Cases

C. Romero; M. Vazquez; J. D. Solano; J. C. Lopez; R. Zaballa; L. Gonzalez; M. A. Calvo; M. C. Etxezarraga
*Basurto Universitary Hospital/ Basque Country University, Bilbao, Vizcaya, Spain*

**Objectives:** At least 30–40% advanced NSCLC diagnosis and biomarkers assessment is made by citology samples alone. However, currently PDL1 determination on cytology samples is not validated. Our aim is to verify the PDL1 assesment feasibility on cytology cell blocks and their correlation with the PDL1 expression on biopsy samples.

**Methods:** Thirteen cases of advanced NSCLC (10 adenocarcinoma/1 squamous cell carcinoma) diagnosed in our hospital, on wich there are both cell block and biopsy, were selected. Cell blocks were obtained from EBUS-TBNA in ten cases, fine needle aspiration cytology (FNAC) in two cases, and one belong to pleural effusion. Biopsy samples were obtained: ten by needle biopsy (NB), three by endoscopic biopsy (EB)), and two cases were tumoral excision (TE). Ventana PD-L1 SP263 assay was used. Percentage of cancer cells with membrane staining was assessed, with a minimun requirement of 50 cancer cells.

**Results:**

| Cases | Cell block | PD-L1 | Biopsy | PD-L1 |
|---|---|---|---|---|
| 1- | Subcarinal EBUS-TBNA | 0% | Cervical LN,NB | 0% |
| 2- | 4R EBUS-TBNA | 60% | Lung NB | 98% |
| 3- | Paratracheal EBUS-TBNA | 1% | Liver NB | 9% |
| 4- | Subcarinal EBUS-TBNA | 0% | Lung,EB | 0% |
| 5- | 4R EBUS-TBNA | 35% | Cerebelum,TE | 90% |
| 6- | Pleural Effusion | NV* | Lung, EB | <1% |
| 7- | Lung /EBUS-TBNA | 0% | Axilar LN, NB) | 0% |
| 8- | Pancreas/FNAC | 0% | Brain, TE | 0% |
| 9- | 4R EBUS-TBNA | 0% | Cervical LN, NB | 7% |
| 10- | 4R EBUS-TBNA | 47% | Adrenal, NB | 0% |
| 11- | Subcarinal EBUS-TBNA | 5% | Lung, EB | 24% |
| 12- | Subcarinal EBUS-TBNA | 0% | Cervical LN, NB | 0% |
| 13- | Soft tissue FNAC | <1% | Lung, NB | <1% |

LN, lymph node. *NV: No valuable (cell scattering/cancer cell identification difficulty).

**Conclusions:** PD-L1 assessment is feasible on cell blocks using the same criteria than on biopsies. Scoring differences could be explained by tumor heterogeneity and limited tumor representation on samples. Cell dispersion on effussion cell blocks difficults the necessary cancer cell identification for interpretation.

## P6-4 | EGFR Mutation Detection in Supernatant Cell-Free DNA of Cerebrospinal Fluid Cytology

A. Kawahara; H. Abe; K. Murata; Y. Takase; T. Yamaguchi; Y. Naito; J. Akiba
*Kurume University Hospital, Kurume, Japan*

**Objectives:** The cobas® EGFR Mutation Test (Roche Molecular Systems Inc., Branchburg, New Jersey, USA) is approved as a companion diagnostic for osimertinib, a third-generation EGFR tyrosine kinase inhibitor approved in Japan. The aim of this study was to evaluate the concordance of EGFR mutation detection between histology and paired cerebrospinal fluid (CSF) cytology samples of non-small cell lung cancer (NSCLC) patients using the cobas® EGFR Mutation Test v2.0.

**Methods:** A total of 17 NSCLC patients with paired CSF cytology and histology samples were enrolled in this study. Supernatant cytology cell-free DNA (ccfDNA) in CSF was analyzed for EGFR mutations using the cobas® EGFR Mutation Test v2.0, and the concordance rates between cytology and histology were calculated.

**Results:** Of the seventeen CSF cytology samples, 47.1% (8/17) were valid and 52.9% (9/17) were invalid. The positive, negative and overall percent agreements between the valid CSF cytology samples and histological tissue samples for detection of EGFR mutation were 83.3%, 100.0% and 87.5%, respectively. Amounts of both inflammatory cells and cancer cells in CSF cytology samples were higher in the valid evaluation group than in the invalid group, and mutant EGFR was also detected in 2 CSF cytology samples with negative cytology (25.0%; 2/17).

**Conclusions:** These data demonstrate that the cobas® EGFR Mutation Test v2.0 can detect the EGFR mutation from supernatant ccfDNA of CSF cytology samples. Utilization of supernatant ccfDNA in CSF will allow us to perform both EGFR mutation analysis and cytopathological diagnosis at the same time.

## P6-5 | Beta-Catenin Expression on Thyroid Fine Needle Aspirates Is Ubiquitous in Oncocytic Lesions

S. L. Wong; K. L. Lim; L. H. Song; S. Mantoo; L. Y. Khor
*Singapore General Hospital, Singapore*

**Objective:** Thyroid fine needle aspirates (FNA) rich in oncocytes are challenging to interpret in limited cellularity and/or cytologic atypia settings. β-catenin has been implicated in oncocytic cell carcinoma oncogenesis via the Wnt/ β-catenin pathway. Our objective was to analyze β-catenin protein expression in a range of thyroid oncocyte-rich aspirates with low to moderate cellularity.

**Materials/Methods:** Following Institutional Review Board approval, a database search of FNA oncocytic lesions diagnosed within a 5 year period was performed. Ten cases, with diagnoses of atypia of undetermined significance (AUS) (5 cases) and suspicious for follicular neoplasm (SFN) (5 cases), with follow-up histology, were selected for β-catenin expression analysis. Histologically, they included minimally-invasive oncocytic cell carcinoma (3 cases), oncocytic cell adenoma (3 cases), 'adenomatoid nodule with oncocytic cell change' (2 cases) and lymphocytic thyroiditis (2 cases). Two methods were used based on cellularity and feasibility for cell block preparation. Method 1 involved de-staining of cytologic smears followed by direct immunocytochemistry, while Method 2 involved scraping of cellular material from the smears, followed by cell block preparation and immunohistochemical staining (Dako).

**Results:** 125 FNA cases with histological confirmation were identified. Thirty-five were oncocytic adenomas, 9 minimally-invasive oncocytic cell carcinomas and the rest benign. The oncocytic cell adenomas had prior diagnoses of benign (4 cases), AUS (15 cases) and SFN (16 cases); the oncocytic cell carcinomas had prior diagnoses of AUS (1 case) and SFN (8 cases). Nine of the ten cases selected for immunostaining showed moderate to strong membrane and/or cytoplasmic staining. No difference was seen in the pattern and intensity of staining between malignant and benign lesions. One case showed negative β-catenin expression ('adenomatoid nodule with oncocytic cell change').

**Conclusion:** Protein expression was reliably analyzed in limited cellularity FNA samples. However, β-catenin protein expression did not distinguish between oncocytic cell lesions of different biologic behaviour.

## P6-6 | PD-L1 (22C3 Clone) Immunohistochemistry Validation in Cytological Samples

M. P. Gónzalez Gutiérrez; S. J. Sánchez Luizaga; L. M. Fernández Fernández; R. E. Ugalde Herrá; C. Miguel Ruiz; M. Ariza Prota; C. Bueno Fernández; A. González Rivero; H. M. Mendes Moreira; H. E. Torres Rivas
*Hospital Universitario Central de Asturias. Oviedo. Spain*

**Introduction:** Immunotherapy is an effective treatment for advanced stages of lung cancer. It is required a precise diagnostic process so that we can identify patients who can benefit from it. PD-L1 immunohistochemistry is widely validated on tissue samples, but not on cytological samples (which are, nowadays, one of the most frequently used in the diagnostic process of this kind of patients).

**Objectives:** To demonstrate the correlation between PD-L1 immunohistochemistry in tissue and cytological samples.

To validate and confirm the usefulness of PD-L1 assessment on cytological samples.

**Methods:** We obtained parallel (from identical location) tissue samples and cytological samples from 97 patients with advanced stage

carcinoma. We determined PD-L1 immunohistochemistry on both samples and compared the obtained results, considering location, stage, histological type, sample type and PD-L1 immunohistochemistry. PD-L1 staining was classified as: Negative (<1%), Weak Positive (1–49%) and Strong Positive (>50%). All samples had more than 100 tumorous cells.

**Results:** 69 men and 28 women, with a mean age of 65 years-old (40–86), 72% of them with Stage IV cancer. Biopsy samples, 44% were PD-L1 negative, 21% weak positive and 35% strong positive. Cytological samples, 60% were PD-L1 negative. 20% weak positive and 20% strong positive.

Considering the immunohistochemistry results of PD-L1, the correlation coefficient between tissue and cytological samples was 0.56 ($p<0.05$).

**Conclusions:** Although the sample may be considered limited, this study supports the usefulness of PD-L1 immunohistochemistry on cytological specimens. This is one of the firs PD-L1 immunohistochemistry studies in "real specimens" that validates the use of cytological samples.

## P6-7 | Predictive Validation of P16 Immunocytochemical Staining for Metastatic HPV Positive Head & Neck Squamous Cell Carcinoma in Cervical Lymph Node FNAS

J. E. Kwon[1]; J. H. Han[1]; J. H. Kim[1]; H. Lim[1]; G. Kang[2]; J. Y. Kim[2]; K. Park[2]; H. J. Kim[2]

*[1]Ajou University, College of Medicine, Suwon, Korea; [2]Inje University, Sanggye-Paik Hospital, Seoul, Korea*

**Objectives:** The human papillomavirus (HPV) has been established as an important cause of about 25% of head and neck squamous cell carcinoma (HNSCC) arising in oropharynx (OPSCC). These tumors have a tendency of early nodal metastasis, even though in case of inapparent disease. We try to evaluate a predictive value of p16 immunocytochemical validation in fine needle aspirates from cervical lymph nodes, resulted as metastatic squamous cell carcinoma.

**Methods:** Data was collected for 64 cases of regionally metastatic HNSCC from 2 institutes that has undergone FNAC samples, with subsequently histologic establishment (node dissection, and biopsy form primary site). Among them, 47 cases can be evaluated and they are categorized as three groups: 17 cases of HPV+ HNSCC, 21 cases of HPV- HNSCC, 9 cases of EBV positive nasopharyngeal carcinoma. Each one slide from FNAC slides was selected and then p16 immunocytochemical staining was done after decoloration.

**Results:** In 17 cases of HPV + HNSCC, 10 cases showed positive for p16 immunocytochemistry (59%). Five cases cannot be evaluated due to small number of tumor cells in necrotic and cystic change. Two cases are negative. 30 cases of p16 negative HNSCCs including nasopharyngeal carcinomas are predominantly negative (18/30, 60%), except for noncontributary cases (12).

**Conclusions:** For patients with metastatic HNSCC, p16 staining relatively reflects HPV status of primary tumors. Because many cystically metastatic cases have a limitation of scanty tumor cells, HPV tests from aspiration cytology samples would be recommended for prospective study.

## P6-8 | Detection of HIV mRNA in Liquid Based Cytology Specimens in the follow up of HIV+ Patients

M. J. Brito[1]; A. Quintas[1]; P. Sequeira[1]; F. Ventura[2,3]; C. Martins[2]; A. Félix[2,4]

*[1]Hospital Garcia de Orta, Almada, Portugal; [2]CEDOC, Chronic Diseases Research Center, NOVA Medical School|FCM, Fundação Universidade NOVA de Lisboa, Lisboa, Portugal; [3]Centro Hospitalar Lisboa Ocidental, CHLO, Lisboa, Portugal; [4]Instituto Português de Oncologia de Lisboa Francisco Gentil (IPOLFG)*

**Objectives:** To study the presence of HIV in cervical liquid based cytology samples (LBC) and to correlate with peripheral blood (PB) HIV viral load, HPV co-infection and High Grade Intra-Epithelial Squamous Cervical Lesions (HSIL).

**Methods:** During 2016 and 2017, sixty four (64) HIV infected women under cART were enrolled in this study. PB HIV viral load and HSIL lesions occurrence were retrieved from clinical files. Assessment of HIV and HPV mRNAs on LBC (Thin Prep®) were carried out, using the Aptima® tests. Data were analyzed by Chi-square statistic test.

**Results:** Eleven (17.2%) of the women presented detectable viral load in LBC, 5 also with PB viral load. Only one patient with PB detectable viral load (1.6%) did not show HIV in LBC.

High-risk HPV mRNA (HPV-HR) was detected in 42.1% (27/64 pts). The majority of patients with detectable HPV (81.5%) were positive for other high risk types than 16 or 18 (HPVHR-other).

HSIL histology occurred in 7 out of 64 patients: 3 had detectable HIV in LBC and 4 of women had no detectable HIV, at the time of the diagnosis. All but one patient with HSIL had HPV-HR in LBC (6/7).

Two out of three patients with HSIL and both HIV and HPV detectable were positive for HPVHR-other.

The occurrence of HSIL histology tended to be higher in women with detectable HIV viral load ($p = 0.076$).

**Conclusions:** We demonstrated that HIV mRNA is present in routine LBC, even in patients without detectable PB viral load. HSIL was more prone to occur in women with cervical HIV viral load; and associated with non HPV16.

## P6-9 | Programmed Death-Ligand 1 (PD-L1) Immunohistochemistry (IHC) Testing of Lung Cancer Cytology Specimens with Cell Block. A Single Institution Retrospective Analysis of 41 Patients

M. Martino; M. A. Revuelta; I. Lastra
*Valdecilla University Hospital, Santander, Spain*

**Objectives:** Non-small cell lung cancer (NSCLC) accounts for approximately 80% of lung cancers and the majority are already unresectable and metastatic upon their initial diagnosis. Current advancement of immunotherapies is evolving. PD-L1 expression as detected by IHC helps predict patient response to anti-PD-L1 immunotherapeutic agents in advanced NSCLC. In this study, we describe our institution's experience with PD-L1 IHC testing of advanced NSCLC cytology specimens using CB.

**Material and methods:** All cases of NSCLC cytology samples for which PD-L1 testing was requested between 2014 and 2017 in our department were included. PD-L1 was quantified using IHC-based 22C3 pharmDx assay. Patient's medical records, cytological smears and CB were review.

**Results:** A total of 41 patients had PD-L1 testing requested on CB of cytological samples, 26 (63%) men and 15 (37%) women (mean age 68 years, range 43–87), 35 (85.4%) adenocarcinoma, 3 (7.3%) squamous cell carcinoma and 3 (7.3%) non-small cell carcinoma (subtype cannot be determinated). 30 cases of stage IV, 6 of stage IIIA, 4 of stage IIIB and 1 of stage IIB. Cytological specimens were obtained from endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) (28), pleural (8) and pericardial (2) effusions, bronchial aspirates (2) and pre-resection pleural lavage cytology (1). 27 (66%) patients had only cytological samples. 17 (41, 5%) had no PD-L1 expression, 10 (24, 4%) low and 12 (29, 3%) high expression and 2 (4, 8%) invalid. 6 patients were treated with PD-L1 inhibitors. 11 patients died.

**Conclusions:** In our institution, 95% of NSCLC cytology samples with CB for which PD-L1 testing was requested had a valid result. So PD-L1 expression is feasible on cytological specimens and ability to predict response to immunotherapy.

## P6-10 | Is There An Antiproliferative and Antitumoral Effect of 'Salvia Officinalis' Extract in Melanoma Cell Lines? An Immunocytochemical and Molecular Evaluation in Cell Blocks

M. Gamsizkan[1]; B. Onal[1,2]; M. Alpay[1]; Z. Gamsizkan[1]; S. K. Coskun[1]; A. Bahcivan[1]; I. Yilmaz[2]
*[1]Duzce Unıversity, Konuralp campus, Turkey; [2]Health Sciences University, SAH Teaching and Research Hospital, Istanbul, Turkey*

**Objectives:** The 'Salvia officinalis' extract from the Lamiaceae family is a phenolic compound used for years.As well as antioxidant,antidiabetic and antimicrobial activities,there is studies about anticarcinogenic effects;however,there is limited information on melanomas.The effects of S.officinalis on different melanoma cell lines (B16F10/B16FO) were evaluated by immunocytochemical,biochemical and molecular data.

**Methods:** The cell lines cultured in DMEM culture medium (Life Technologies,Carlsbad,CA,USA)with 10% fetal bovine serum contained 0.1 mg/ml streptomycin,100 U/ml penicillin, and 0.25 g/ml gentamycin(Lonza).The cells were cultured at 37°C in a humid atmosphere saturated with 5% $CO_2$ at 95% relative humidity. Melanoma cells were exposed to 1 ml of ethanol for 24 h with *Salvia officinalis* at following concentrations; 50, 100, 200, 400, 800 mg/ml. Control cells were treated with ethanol/DMEM medium for incubation.MTT was used for analysis of melanoma cell viability.The optimal concentration was detected with LD50 calculation also follow up proliferation by inverted microscopy.The treated solutions containing nonadherant melanoma cells were removed and centrifuged. Formed cell pellets were washed in buffered saline and returned to the respective wells with culture medium after 24 h' incubation. Immunocytochemically,Ki-67, BAP1, β-catenin, WT-1, CD117, SNAIL, ZEB2, P16, Bcl-2 and Bcl-6 were applied to the cell blocks obtained from the experimental and control group cell pellets. Besides, BRAF and TERT promoter mutation analyzes were evaluated by pyro sequence analysis.

**Results:** MTT assays of the F0/F10 cell lines were measured in the control group at 1369/1442 nm, 50 mg/ml at 1261/1314 nm and 200/ml at 0.921/0.888 nm, respectively. Compared to untreated control cell lines,there was a marked decrease in cellularity in extract-treated lines.It was noted that the high β-catenin expression in control group disappeared in extract applied groups. Clones with no immunexpression with WT-1 and Ki-67 were found to be more susceptible to S.officinalis.

**Conclusions:** The cytotoxic effect of S. officinalis may lead to a decrease in tumor cellularity and different molecular analysis could be helpful to understand the main effective mechanism.

## P6-11 | Immunocytochemistry in Liquid-Based Exfoliative Cytology: 10 Years of Institutional Experience

R. Luis[1,2]; M. M. Almeida[1]
*[1]Hospital de Santa Maria – CHLN EPE, Lisbon, Portugal; [2]Faculdade de Medicina – Universidade de Lisboa, Lisbon, Portugal*

**Objectives:** Liquid-based preparations have long been applied for both aspirative and especially exfoliative cytology samples. They allow for prolonged preservation and automated processing of specimens, providing clean background slides with homogeneous cellular spreads where morphology can be detailed despite the occasional

artifacts. Additionally, slides can be promptly stained through immunocytochemical techniques, hence tackling potential concerns and increasing the diagnostic yield. Herein, we present our 10 year-long experience of immunocytochemical studies in liquid-based exfoliative cytology.

**Methods:** All reports of serous effusion, cerebrospinal fluid and respiratory tract exfoliative cytology concerning the 2008–2017 period were retrospectively assessed. Reports accounting for immunostaining employment and harbouring a diagnosis of malignancy were stratified according to the topography of the sample, evaluated antibodies and extent of the final diagnosis, regarding whether it was primary, confirmatory or inconclusive for the type/origin of the neoplasm.

**Results:** A total of 19 946 reports were reviewed, encompassing 303 samples which underwent immunocytochemical techniques and heralded malignancy (187 serous effusions, 14 cerebrospinal fluids and 102 respiratory tract specimens). A total of 694 immunostains were used, comprising 56 different antibodies; the thoracic (pleural/pericardic) effusions employed 293 stains (mainly TTF-1, CK7 and CK20), the respiratory tract 220 (mirroring the high demand for TTF-1, CK7 and CK20), the peritoneal cavity 162 (namely CK7, CK20 and Ca125) and the cerebrospinal fluid 19 (evenly distributed among cellular lineage markers). Regarding the final response, 155 specimens allowed for an inaugural diagnosis, 115 confirmed the clinical diagnosis and 33 were inconclusive for the type/origin of the neoplasm.

**Conclusions:** Liquid-based preparations are a remarkably flexible tool in exfoliative cytology, allowing the immediate use of immunostains which can provide key diagnostic information and drive further clinical efforts. In our institution, 303 samples that would have otherwise been deemed suspicious (or even negative) for malignancy were thus accurately diagnosed through the use of such ancillary techniques.

## P6-12 | The Comparison of the Efficiency of P16/KI67 Proteins Coexpression and P16 Protein Monoexpression for the Detectiin of Severe Cervical Pathologies in HPV-Positive women

G. Leshkina[1]; O. Shipulina[1]; I. Shabalova[2]

*[1]Central Research Institute of Epidemiology, Moscow, Russia; [2]Russian Medical Academy of Postgraduate Education, Moscow, Russia*

**Introduction:** The determination of P16 and Ki67 proteins co-expression in cytological samples became widespread as a highly specific test for the detection of HPV-associated severe cervical pathology. However, as the practice shows, the test list of small laboratories still contains the detection of P16 protein mono-expression.

**Objective:** to compare the efficiency (sensitivity and specificity) of HSIL (CIN-2+) determination using the double test (P16 and Ki67) and the test for P16 protein alone.

**Materials and methods:** the study included 388 patients with the cytological results of NILM и ASCUS+. The cytological samples were prepared using the BD SP method, the HPV of high oncogenic risk was determined using the PCR method (АМПЛИСЕНС/AMPLISENSE). The Cintec Plus Cytology Kit (Rosh Diagnostics) was applied for the immunocytochemistry staining.

**Results:** The quantitative assessment obtained for these samples demonstrated the high sensitivity (92.8%) and specificity (89.8%) of P16 and Ki 67 co-expression, while the specificity of the detection of P16 protein mono-expression showed the significant difference with the decrease of this specificity ($p < 0.05$).

**Conclusions:** The determination of P16 protein expression alone for the detection of the severe pathology demonstrated low specificity compared to the co-expression of P16/Ki67, which leads to a great number of false-positive results.

The authors have indicated no interest with commercial supporters.

# P7 DIGITAL CYTOLOGY

## P7-1 | Set Up of a Countrywide Online Slide Evaluation Session for Cytology: Method, Results, Findings and Perspectives

C. Degaillier[1,4]; Y. Sucaet[2]; W. Waelput[1,2]; B. Weynand[3,4]

*[1]Universitair Ziekenhuis Brussel (UZ Brussel), Brussels, Belgium; [2]Vrije Universiteit Brussel (VUB), Brussels, Belgium; [3]UZ Leuven, Leuven, Belgium; [4]Cytology section, Belgian Society of Pathology, Gent, Belgium*

**Objectives:** External quality assessments (EQA) and testing rounds with cytological slides are time-consuming and complicated.

For its cytotechnologists workshop of 2017, the Cytology Section of the Belgian Society of Pathology organized a testing round in cervix cytology.

The UZ Brussel, using an online platform to test, tune and train its professionals in histopathology, wanted to evaluate whether this platform could serve the same purpose for cytology, on a national level.

**Methods:** The 2 institutions gathered the information of the workshop participants to register them in the online platform, organized the collection of 5 cases from 3 different academic hospitals, digitalized the slides into Whole Slide Images using a slide scanner (Leica Aperio CS2). Then, an online evaluation session was created that allowed participants to view the scanned slides and assign a diagnosis according to the Bethesda Classification, in the weeks preceding the workshop.

**Results:** From the 70 invited, 42 participants completed the evaluation in 2 weeks' time. It was largely experienced as positive, according to the feedback received from the participants through a 'Remarks' box foreseen online and the increased interaction during

the workshop when the cases were presented. The overall results and remarks from the online evaluation were also presented. A certificate of participation was issued at the end to those who completed the evaluation.

**Conclusions:** Prior online viewing of cytology cases can be a great added value for slide seminars. The good response rate from the participants shows a great interest in this kind of setup.

This experiment demonstrates that it is feasible to use digital microscopy for the aforementioned purpose. By extension, this setup (prior online viewing and scoring with delivery of a certificate) can facilitate tunings, trainings and EQAs, in both an intra- and inter-institutional context.

## P7-2 | Fine Needle Aspiration Cytology Sampling Can Be Assessed Through Digital Pathology

E. Alcaraz-Mateos[1]; I. Turic[2]; A. Abdelraheem[3]; C. Alcolea-Guardiola[1]; A. Abellán-Palazón[1]; F. Caballero-Alemán[1]; F. García-Molina[1]; E. Poblet[4]

*[1]Morales Meseguer University Hospital, Murcia, Spain; [2]Faculty of Medicine, University of Split, Croatia; [3]Faculty of Medicine, Assiut University, Egypt; [4]Reina Sofía University Hospital, Murcia, Spain*

**Objectives:** Presently, due to molecular requirements and diagnostic accuracy, where not only the quality of the sample is important, but also the quantity, we consider the possibility of quantifying samples obtained with three different methodologies: standard fine needle aspiration cytology (FNAC), capillary or without aspiration (FNNAC), and assisted by an extender (E-FNAC). Digitization and image analysis were used for standardization of the results.

**Methods:** In a simulated environment and using the patented FNA training manikin WO2016185077, which was filled with banana pulp (selected due its abundant cellularity and low background), two pathologists performed three iterations each of the FNAC, FNNAC and E-FNA techniques for the same time period (5″). 25-gauge needles were used and vacuum was generated using a Cameco 20-cc syringe holder. To avoid bias, the same pathologist expelled all the material obtained from each procedure on a single slide and prepared all the smears, obtaining 2 slides per procedure. The slides were digitized (iScan Coreo) and the resulting images were analyzed with Image J and Fiji software.

**Results:** The average sample size and the percentage of the sample per slide were 24.1 $mm^2$ (1.9%), 43.7 $mm^2$ (3.5%) and 47.6 $mm^2$ (3.8%) for the FNNAC, FNAC and E-FNAC techniques, respectively. The average storage size in megabytes (MB) per slide was 38.5 MB (FNNAC), 100.8 MB (FNAC) and 80.8 MB (E-FNAC).

**Conclusions:** It is possible to quantify and compare sample quantity proceeding from the FNAC, FNNAC and E-FNAC procedures in a simulated environment via digitizing and image analysis.

This data presents greater objectivity and precision than those based on individual perception and the naked eye.

In the study carried out, fine needle aspiration, conventional or using an extender, allows for more sample to be obtained, although the latter (E-FNAC) requires an assistant to perform the procedure.

## P7-3 | A Novel Multidimensional Texture Analysis Approach for Automated Grading of Invasive Breast Carcinoma

K. Dimitropoulos[1]; P. Barmpoutis[1]; C. Zioga[2]; A. Kamas[2]; K. Patsiaoura[2]; N. Grammalidis[1]

*[1]Centre for Research and Technology Hellas, Thessaloniki, Greece; [2]Agios Pavlos General Hospital, Thessaloniki, Greece*

Breast cancer is the most common cancer in women and it is widely characterized as a complex and heterogenous disease. Due to the important role of histological grading to its treatment, we address the problem of automated grading of invasive breast carcinoma through the encoding of histological images as VLAD (Vector of Locally Aggregated Descriptors) representations on the Grassmann manifold. The proposed method considers each Hematoxylin and Eosin stained breast cancer histological image as a set of multidimensional spatially-evolving signals that can be efficiently represented as a cloud of points in a non-Euclidean space, such as the Grassmann manifold. To evaluate the efficiency of the proposed methodology, two datasets with different characteristics were used. More specifically, we created a new medium-sized dataset consisting of 300 annotated images (collected from 21 patients) of grades 1, 2 and 3, while we also provide experimental results using a large dataset, namely BreaKHis, containing 7909 breast cancer histological images, collected from 82 patients, of both benign and malignant cases. Experimental results have shown that the proposed method provides high detection rates in both cases (average classification rates of 95.8% and 91.38% with our dataset and the BreaKHis dataset, respectively), outperforming a number of state of the art approaches. The key advantage of the proposed method over existing methods is the fact that it exploits both image dynamics and appearance information, while at the same time it avoids the detection of the histologic primitives, such as nuclei, which is usually a challenging task due to the complex appearance of the tissue. In medical laboratories, the proposed methodology could be proved a powerful tool that can be used either as a screening tool or to solve efficiently the problem of inter-observer variations in the assessment of the subjective criteria.

## P7-4 | Introduction and Development OF A Digital Non Gynaecological Diagnostic Cytology Interpretative Scheme

C. Hodgson[1]; P. Cross[2]

*[1]UK NEQAS CPT, Gateshead, UK; [2]Queen Elizabeth Hospital, Gateshead, UK*

**Objectives:** Interpretive external quality assurance (EQA) schemes are well established for histopathology but not for non gynae diagnostic cytology (DC). The current DC interpretative scheme has operated since the 1990's utilising glass slide preparations from a range of non gynae cytology cases, circulated to cytology laboratories. This timely review of the process and practicalities of delivering such a service, by UK NEQAS CPT, will allow the scheme to be available to the UK, Europe and beyond.

**Methods:** Many histology interpretative EQA schemes use digitally scanned slides in their schemes, but traditionally cytology samples do not all lend themselves to this due to the variety of sample preparations. This pilot will solely utilise digitised scanned cytology slides, to allow for ease of access and to allow instant feedback and education.

Eight scored cases for individual assessment and two un-scored cases purely for education, derived from serous fluids, respiratory, head and neck and urine cytology cases.

**Results:** UK NEQAS CPT already have systems available for data collection / analysis to enable evolving from paper based systems, and allow online assessment by participants, result entry for each individual.

The scheme will utilise simple scoring initially for ease of use and overall proof of scheme concept. Scoring will be two tier: Benign vs. malignant. Participants must categorise using benign/malignant diagnosis, and can opt to give a specific diagnosis if they feel they can.

**Conclusions:** The scheme aims to promote quality and education for all those involved in screening and reporting diagnostic cytology. It will be open to both medical and non-medical, as well as cytology trainees. It will provide good examples of cytological entities which will allow for individual feedback and education, and promote education within cytology, as well as informing the laboratory accreditation process.

## P7-5 | Diagnostic Accuracy of Virtual Pathology vs. Traditional Microscopy in the Evaluation of Thyroid Fine Needle Aspirates

J. A. Jiménez Heffernan[1,2]; P. Muñoz-Hernández[2]; G. Díaz Zelaya[1]; M. Joly[1]; P. López-Ferrer[1,3]; L. Bedmar[1]; M. Álvarez[1]; A. Cabrera[1]; R. Angulo[1]; J. A. López García-Asenjo[1]

*[1]Labco Pathology, Madrid, Spain; [2]University Hospital La Princesa, Madrid, Spain; [3]University Hospital La Paz, Madrid, Spain*

**Objectives:** To evaluate whether diagnosis from whole slide imaging (WSI) on a digital microscope is inferior to diagnosis of glass slides using traditional microscopy (TM) in a series of thyroid fine needle aspirates.

**Methods:** 110 cases corresponding to the most common thyroid lesions were selected. They had the following distribution according to Bethesda categories: I (n = 3), II (72), III (6), IV (7), V (2) and VI (19). In addition to colloid lesions, category II included chronic autoimmune and granulomatous thyroiditis cases. 21 malignant tumors were present (17 papillary and 4 medullary carcinomas). Categories IV-VI had a histological correlate. For comparative purposes these 110 cases were considered as the gold standard (GS) diagnoses. All the slides corresponded to air-dried, Diff-Quik stained smears obtained using ultrasonographic guidance in the presence of a pathologist. One representative glass slide was digitalized as WSI at ×60 magnification (Ommyx VL120, General Electrics). A blind examination using TM and WSI was performed by four cytopathologists. Intraobserver concordance between TM and WSI was determined as well as interobserver concordance.

**Results:** Mean intraobserver concordance between WSI and TM was 95.2% (93.2–99.2%). Mean interobserver concordance was 95.3% (91.2–97.3%) for TM and GS and 94.8% (89.2–98.2%) for WSI and GS. Most lack of concordance involved categories III and V. The few misdiagnoses concerning malignancy (only papillary carcinoma) occurred regardless the visualization method employed. Non-representative cases were similarly detected by both methods.

**Conclusions:** Diagnosis from WSI was found equivalent to diagnosis using TM. A limit of the present study is that we used only one representative slide per case. The scanning and examination of several glass slides raises the question of time efficiency. The study was made by cytopathologists with no prior training in WSI interpretation so better results can be expected with future experience.

# P8 SOFT TISSUE CYTOPATHOLOGY

## P8-1 | Aspiration Cytology of Low-Grade Myofibroblastic Sarcoma

M. Taweevisit[1]; P. S. Thorner[1,2]

*[1]Chulalongkorn University, Bangkok, Thailand; [2]Hospital for Sick Children and University of Toronto, Toronto, Canada*

**Objectives:** Low-grade myofibroblastic sarcoma is a rare tumour with an indolent behaviour and a propensity for local recurrence but limited metastatic potential. Fewer than 60 cases have been reported. The tumour tends to arise in the soft tissue of the head and neck. This tumour can be misinterpreted as other benign and malignant lesions occurring in this region. The cytologic findings by fine needle aspiration have never been reported.

**Methods:** A 66-year-old male presented with a left parotid mass. Fine needle aspiration was performed followed by tumour resection.

**Results:** Fine needle aspiration showed spindle-shaped cells interpreted initially to be the myoepithelial component of a pleomorphic adenoma. Pathologic examination of the resection specimen showed, instead, a low-grade myofibroblastic sarcoma, which was confirmed by immunohistochemistry and electron microscopy. A review of the cytologic material enabled features to be recognized corresponding to the histologic findings. Tumour cells showed mildly to moderately

pleomorphic nuclei with small distinct nucleoli. Nuclear contours ranged from ovoid to fusiform with occasional wavy and angulated nuclei. Tumour cells were associated with a collagen matrix.

**Conclusions:** To the best of our knowledge, this is the first description of the cytologic features of low grade myofibroblastic sarcoma, which should aid in the recognition of this entity. This diagnosis is a challenge in head and neck pathology, both because of the rarity of this tumour and the overlap of cytologic findings with other spindle cell tumours that can occur in the same region.

## P8-2 | Panniculitis-Like T Cell Lymphoma Fine Needle Aspiration Cytology (FNAC): A diagnostic pitfall. Two cases report

A. El-Habashi; A. Aly
*National Cancer Institute, Cairo University, Egypt*

Panniculitis like T-Cell lymphoma (PLTCL) is a challenging diagnosis that can be misinterpreted clinically and histologically as well as in FNA material. Clinically, it can be similar to panniculitis, fat necrosis or cellulitis. Also, it might be overlooked histologically as panniculitis or inflammatory reaction or injection granuloma. In this work, we report two cases of PLTCL; one case was 63 Y-O female patient presented with multiple trunk and left breast subcutaneous nodules covered by edematous hyperemic dusky stretched skin and a second case as 55 Y-O female presented with left buttock subcutaneous mass. Both cases underwent FNAC as a prime investigation. The first case was misinterpreted as panniculitis with granulomatous reaction on FNAC and subsequent histology proved to be PLTCL on morphology and immunohistochemistry, retrospective evaluation of the smears showed occasional slightly atypical large round cells with high N/C ratio, irregular nuclear membrane and fine granular chromatin with occasional conspicuous nucleoli. Those cells showed positive T-Cell markers and negative B-cell markers on smear immunocytochemistry. While the second case FNAC showed fair number of atypical large round cells with high N/C ratio, irregular nuclear membrane and prominent nucleoli. Those cells classified as large tumor cells for ICC on cell block preparation. The ICC results showed positive immunoreactivity for T-Cell markers and high Ki-67 labeling index. Subsequent histology was misinterpreted as panniculitis and fat necrosis. PLTCL is a diagnostic pitfall (clinically, histologically and cytologically) that should be suspected in cases presented with panniculitis. Meticulous FNA cytomrphologic examination along with application of an appropriate immunocytochemical panels should prevent missing or delaying the diagnosis of such aggressive disease.

## P8-3 | Cytologic Features of Juvenile Xanthogranuloma

J.-H. Nam; C.-S. Park; Y.-D. Choi
*Chonnam National University Medical School, Gwangju, Republic of Korea*

**Backgrounds:** Juvenile xanthogranulotna (JXG) is a non-Langerhans cell histocytic proliferation that may appear as an extracutaneous deep-seated lesion and give a broad clinical differential diagnosis. We report the fine needle aspiration cytologv (FNAC) findings of deep JXG.

**Case:** A 5-month-old infant was incidentally found to have a mass on left supraclavicular area. Neck MRI (magnetic resonance image) demonstrated a 3.8-cm soft tissue mass showing displacement of neurovascular bundles. Clinically, malignant soft tissue tumor was suspected. A broad differential diagnosis prompted FNA to evaluate the mass lesion. Aspirate smears of the mass exhibited numerous finely vacuolated histocytes, eosinophils, multinucleated giant cells and scattered Touton giant cells. Many of the histiocytes had reniform or grooved nuclei, resembling Langerhans cells. On cell block, the histiocytes were immunoreactive for CD68 but were nonreactive for CD1a and S-100 protein. Subsequent excisional biopsy confirmed the diagnosis of JXG.

**Conclusion:** JXG should be considered in the differential diagnosis of any histocytic/fibrohistiocytic soft tissue lesion of childhood, and this entity can be accurately diagnosed by FNAC and immunohistochemical findings.

## P8-4 | Cytologic Diagnosis of Alveolar Soft Part Sarcoma Presenting as a Chest Wall Mass: A Case Report

Y.-D. Choi; C.-S. Park; J.-H. Nam
*Chonnam National University Medical School, Gwangju, Republic of Korea*

**Backgrounds:** Alveolar soft part sarcoma (ASPS) is a rare soft tissue neoplasm, having various morphological mimics, especially on fine needle aspiration cytology (FNAC). Because no definite immunohistochemical markers are available to aid a correct diagnosis, knowledge of the cytomorphological features is essential for correct patient management.

**Case:** A 35-year-old male patient presented with a complaint of left sided chest wall swelling which was gradually increasing in size since two years. Chest CT (computed tomography) revealed a soft tissue mass, measuring 5.0×4.0 cm, in the left chest wall, abutting the left pectoralis major muscle. In order to rule out a malignancy, FNAC was performed. Smears were hemorrhagic and cellulary was low. It showed a prominence of bare nuclei and a granular-appearing background or the presence of cytoplasmic

fragments. Intact large cells were dispersed. The cells have an enormous amount of finely granular or vacuolated cytoplasm, markedly enlarged nucleoli. The cytomorphology revealed a strong similarity to renal cell carcinoma, clear cell type. Subsequent operation was performed, the mass was diagnosed as ASPS.

**Conclusion:** The cytologic diagnosis of ASPS is possible using FNAC even without the use: of immunohistochemical staining and that the cytomorphology of this neoplasm is relatively (although not completely) distinctive. In addition, an accumulation of sufficient cells to produce a cell block and the addition of TFE3 staining to a panel of immunomarkers may allow for diagnostic accuracy in the cytologic recognition of ASPS.

## P8-5 | Mesenchymal Tumour Diagnosis by Fine Needle Aspiration Biopsy (FNAB) in Endobronchial Ultrasound (EBUS)

A. Herrera Rabadán[1]; L. Scavino Pinto[1]; L. Galeano Paniagua[1]; D. Pita Endara[1]; M. Bauza[1]; V. Martínez i Cózar[1]; D. Riaño Alarcón[1]; M. Prieto Rodríguez[1]; M. J. Artés Martínez[1]; F. J. Vera-Sempere[1,2]

*[1]Hospital Universitari i Politècnic La Fe, Valencia, Spain; [2]Universidad de Valencia, Valencia, Spain*

**Objectives:** To determine the value of cytology studies obtained by EBUS in the diagnosis of mesenchymal thoracic tumors.

**Methods:** Collecting FNAB by EBUS studies from 2015 to 2018 and choosing the cases diagnosed of mesenchymal tumors, from which clinical history, morphology and inmunohistochemical profile was studied.

**Results:** 3 cases of mesenchymal tumors where found.

Case 1: 35 year old male with intrapericardial mass. The cytologic smears revealed a discohesive cellular population. These cells occasionally lacked cytoplasm, others had vacuolated or lateralized cytoplasm "in comet". The nuclei also showed variability, sometimes showing smooth or lobular margins. Mitotic figures where common. Vimentin, miogenina, MyoD1 and CD99 where positive, whereas epithelial, melanic, neuroendocrine and lymphoid markers where negative in the tumor cells. Ki 67 proliferation index was approximately 10%, hence the diagnosis of lymph node metastases of rhabdomyosarcoma.

Case 2: 74 year old woman with a history of liposarcoma diagnosed in year 2000, presented a subcarinal mass. The smears showed lymph node cellularity, accompanied by frequent fragments of fibromyxoid like tissue and capillary structures. There was an occasional presence of adypocites and in less extent, lipoblasts with septated vacuoles.

The diagnosis was lymph node metastases of liposarcoma.

Case 3: 58 year old man with chronic pulmonary thromboembolism of poor evolution. The smear reveals cohesive cell groups, as well as individually disposed or forming fascicles. These cells are ovoid or spindled with moderate pleomorphism.

Inmunohistoquemical stains show reactivity for vimentin, smooth muscle actin and desmin.

The diagnosis was leiomyosarcoma.

**Conclusions:** FNAB by EBUS is a minimally invasive technique that allows the diagnosis of various thoracic pathologies. Even though there are few cases reported it is very helpful in the diagnosis of mesenchymal tumors, both primary and metastastic.

## P8-6 | First Description of a Metastasis of a Myxoid Liposarcoma in the Pancreas

A. M. Luebke; A. Hinsch

*University Medical Center Hamburg-Eppendorf, Hamburg, Germany*

**Background:** Myxoid liposarcoma (MLS) is a malignant mesenchymal neoplasm that usually arises in the deep soft tissues of the extremities and tends to metastasize to bones and soft tissues, followed by the lungs and liver (1). Metastases of MLS to the retroperitoneum are not uncommon (2). However, a metastasis of a MLS to the pancreas has not been reported in the literature. To our knowledge, this is the first description of such a case.

**Case Report:** In 1998 at the age of 50, the male patient developed a liposarcoma of the left thigh with a relapse in 2001. The primary histology is not known. In 2014 the patient developed abdominal metastases suprarenal and subxyphoidal. The therapeutic regimen was chemotherapy (Doxorubicin monotherapy) followed by resection. Histology revealed metastases of MLS with 2% round cell component and characteristic TLS (FUS)-CHOP fusion t(12;16)(q13;p11) (3).

In 2016 a new metastasis was detected in the right proximal femur. The imaging workup including PET-CT revealed an additional lesion in the processus uncinatus of the pancreas. Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) of the hypoechoic tumor - 21 mm in diameter - was performed and the smears were Papanicolaou stained.

Cytology displayed round to oval tumor cells with scant cytoplasm and indistinct cell borders. Delicate arborizing and thin-walled capillaries accompanied the tumor cells together with a background of abundant myxoid matrix. In summary, the picture was consistent with a metastasis of MLS.

The resection specimen confirmed a metastasis of myxoid liposarcoma in the processus uncinatus of the pancreas, again with characteristic TLS (FUS)-CHOP fusion. In the follow-up of 18 months, the patient did not develop further metastasis.

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## P8-7 | Ewing Sarcoma: A Case Report and Literature Review

J. A. Fernández-García; S. González-Moya; M. Montes; D. Lincango; F. Garcia-Fouz; C. Romagosa; S. Ramony Cajal; C. Dinarès; J. Temprana-Salvador
*Vall Hebron University Hospital, Barcelona, Spain*

**Objectives:** Ewing Sarcoma (EWS) represents the prototype of small round blue bone cell tumors. It is a tumor with specific cytogenetic and molecular anomalies (EWS fusions). It occurs most frequently in teenagers and young adults. Males are affected more frecuently than females (ratio of 1.6:1). Usually affects the diaphysis of long bones and pelvis, where it can metastasize to bone marrow and lung.

**Methods:** We present the case of a 47-year-old woman with repetitive sprain ankle which radiologically showed a soft tissue lesion with bony involvement of the distal tibia. Fine needle aspiration (FNA) was performed, obtaining 4 Diff-quick stained smears, 4 Papanicolaou stained smears, a liquid cytology preparation (ThinPrep) and a formalin fixed, paraffin embedded cell block.

**Results:** Cytology smears showed a population of small, round cells with scanty or no cytoplasm, appearing loose or in small rosette-like groups with a tendency to dehiscence. The nuclei membrane was regular, with finely granular chromatin and occasionally small nucleolus. The immunohistochemical study demonstrated positivity for CD99, and negativity for CD45, CKAE1/AE3, CAM5.2, S100, SatB2 and TLE1. EWS gene rearrangement was demonstrated using FISH. The differential diagnosis should be made between neuroendocrine carcinoma, EWS, mesenchymal chondrosarcoma, small cell osteosarcoma, round cell liposarcoma and lymphoma. The techniques performed confirmed the diagnosis of EWS.

**Conclusions:** EWS is an extremely uncommon entity in patients over 30 years of age, especially in women. However it should always be taken into account in the differential diagnosis of round and small blue cell tumors especially in bone and soft tissue. FNA is proven to be a useful method and reliable for the diagnosis of such cases.

## P8-8 | FNAC Diagnosis of Proliferative Myositis in Extension Study of Lung Cancer. A Case Report

M. Vazquez; C. Romero; J. D. Solano; J. C. Lopez; R. Zaballa; L. Gonzalez; M. A. Calvo; I. Rodil; M. C. Etxezarraga
*Basurto Universitary Hospital/ Basque Country University, Bilbao, Vizcaya, Spain*

**Objectives:** Proliferative myositis (PM) is a benign pseudosarcomatous lesion of soft tissue commonly misdiagnosed for malignant soft tissue tumors because of its alarming clinical presentation and cytologycal characteristics.
The objective of this study is to describe cytomorphological characteristics in fine needle aspiration cytology (FNAC); and emphasize the possible risks and difficulties of this technique compared to biopsy, in soft tissue lesions in a metastatic disease context.

**Methods:** A 70 years old male diagnosed of lung cancer, presented a soft tissue swelling in the thigh right region. On FNAC, a differential diagnosis of metastasis and soft tissue lesion was given. Histopathological examination gave a diagnosis of PM.

**Results:** FNAC was yielded scanty material, with fibroblastic like spindle cells mixed with occasional large plump cells with eccentric nuclei and prominent nucleoli in the background of muscle cells, which was suspicious of benign spindle cell lesion.
On biopsy, spindle cells in fascicles resembling mesenchymal tissue, mixed with plump fibroblastic/myofibroblastic spindle cells and large cells with rounded nuclei, prominent nucleoli, discohesive with haphazard distribution, described as ganglion-like cells.
Inmunohistochemical profile of mesenquimal component was keratin (-), TTF-1(-), SMA (+), MDM-2 (+) in ganglion-like cells. Ki67 was 5%.

**Conclusions:** PM is a rare disease. There is a need to propose differential diagnosis of benign and malignant spindle cells lesions of soft tissues. It is an important entity to have into account in different context such as extension study of metastatic diseases.
FNAC is a quick and simple method that can accurately help diagnosing this kind of lesions.

## P8-9 | Radiological, Cytological and Histological Correlation of Giant-Cell Tumour of the Bone

A. Lozano; M. Rodríguez; R. Llatjós; N. Pérez; A. Zanca; M. Pané; E. Mancebo; J. A. Narváez; N. Baixeras; I. Català
*Hospital Universitari de Bellvitge, Hospitalet del Llobregat, Barcelona, Spain*

**Objectives:** To assess the usefulness of fine-needle aspiration (FNA) in Giant-Cell Tumour (GCT) of the bone.

**Methods:** Retrospective study using radiological imaging tests and cytological and histological specimens from 28 giant-cell tumour of

the bone, diagnosed between 2000 and 2016. All slides were stained using Diff-Quik, Papanicolaou (PAP) and cell block technique (CB) in 25 of the 28 cases.

**Results:** From the group of 28 patients, 47% were male and 53% were female, with an average age of 39.22 years old. Regarding location, tumour appeared predominantly in the femur (21.88%), tibia and radius (18.75%), sacrum (9.38%), ulna and iliac (6.25%), pelvis, humerus and vertebrae (3.13%). Microscopically, the following parameters were studied: osteoclast-like giant cells, finely granular chromatin with small nucleolus, wide cytoplasms with well-defined membranes; spindle cell or mononuclear epithelioid cells, isolated or in aggregates; hemorrhagic background, with presence of osteoid, detritus or with a cystic component. Imaging techniques (echography and computed tomography) allowed diagnosis of 89.29% of GCT, 87.51% being confirmed by FNA and 88% by core needle biopsy. Histological study of the surgical tissues confirmed 100% of GCT cases.

**Conclusion:** This study shows that when imaging testing suggests GCT, fine-needle aspiration is a useful, valuable and minimally invasive technique that allows a reliable diagnosis.

## P9 LUNG CYTOLOGY AND MEDIASTINUM

### P9-1 | Myeloid Sarcoma of the Lung Diagnosed By Sputum and Bronchial Brushing Cytology: Report of a Rare Case

H. C. Wang; W. Y. Lee
*Chi Mei Medical Center, Tainan, Taiwan*

**Introduction:** Myeloid sarcoma (MS) is a rare extramedullary tumor composed of myeloid blasts that either precede, follow or present concomitantly with acute myeloid leukemia (AML). MS may occur at any part of the body and develops in a variety of organs. However, pulmonary manifestation is very rare, and there is no case report describing myeloid leukemic cells on sputum smear and bronchial brushing cytology.

**Case Report:** A 61-year-old male with a past history of AML diagnosed and treated with chemotherapy 7 years prior, presented chronic cough for 2 months. Chest computed tomography (CT) showed right perihilar consolidation, partial atelectasis of right upper lobe, mediastinal invasion, mediastinal and right supraclavicular metastatic lymphadenopathy. Cytological examination of sputum and bronchial brushing showed sheets of monomorphic, immature cells with two to three times the size of small lymphocytes. They had a high nucleus to cytoplasm ratio, fine chromatin and scanty to moderate cytoplasm, some with cytoplasmic blebbing. Some cells had striking nuclear indentation presenting as binucleation. Occasional apoptotic bodies were identified. Cytoplasmic granularity was identified in a few cells on Wright-Giemsa stained smear. The appearances were consistent with immature myeloid forms of acute myeloid leukemia. The bronchial biopsy confirmed these findings to represent MS of the lung. Immunohistochemically, the tumor cells were positive for myeloperoxidase (MPO), CD45 and CD117.

**Conclusions:** MS of lung is rare and the diagnosis of MS on respiratory cytology presents a diagnostic challenge. We present a rare case of MS with apparent myeloid blasts on sputum smears and bronchial brushing cytology and highlight the cytomorphologic features necessary for appropriate diagnosis. Although very rare, MS in the setting of a history of AML can be identified on sputum smears and bronchial brushing cytology.

### P9-2 | Diagnosis of Mediastinal Lymph Node Metastases From Prostatic Cancer By Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration: A Case Report

V. Kravtsov; E. Edelstein[1]; D. Shitrit[2]; T. Puzyreva[1]; A. Katzav[1]; L. Elbaum[1]; A. Kartawy[1]; D. Kidron[1]
[1]*Institute of Pathology/Cytology, Meir Medical Center, Kefar-Sava, Israel;* [2]*Department of Pulmonology, Meir Medical Center, Kefar-Sava, Israel*

**Objectives:** Prostatic cancer has a high tendency to spread to bone. Mediastinal lymph nodes and pulmonary metastases are rare manifestation of metastatic prostate cancer commonly develop after pelvic and bone involvement. Few patients with prostatic cancer present initially with symptomatic metastatic lung lesions and mediastinal lymphadenopathy without any other concomitant distant dissemination.
Endobronchial ultrasound-guided transbronchial needle aspiration is a minimally invasive test for investigating mediastinal and hilar lymphadenopathy. It is sometimes difficult to distinguish between a recurrent malignant lymph node and lymphadenopathy due to sarcoidosis in patients who develop lymphadenopathy after surgery for a malignant tumor.

**Methods:** Cell block, H&E stain and immunohistochemical stains for PSA and PIN cocktail (P504S and basal cell cocktail, including 34βE12 and p63) were performed on cell block from endobronchial ultrasound-guided transbronchial needle aspiration material.

**Results:** A 80-year-old man with prostatic adenocarcinoma Gleason Score 9, diagnosed befor 10 years and threated by TUR-P channelling, radio and hormonal therapy. There was found over absorption by PET-PSMA in lung lesions, pleura and mediastinal lymph nodes. Liver, spleen and adrenals were negative for absorption. Endobronchial ultrasound-guided transbronchial needle aspiration was performed from lower right paratracheal lymph nodes.
Groups of atypical cells were present in cell block from aspiration material and were positive for immunohistochemical stains for PSA and P504S (PIN cocktail, cytoplasmic stain).

**Conclusion:** Endobronchial ultrasound-guided transbronchial needle aspiration might useful in diagnosis of unusual metastatic tumors in mediastinal lymph nodes.

## P9-3 | Results of Cytological Examination of Bronchial Washings and Correlation of Lung Cancer Types with Smoking. A 1-year Retrospective Study

N. Koufopoulos[1]; K. Kosmas[2]; G. Mitropoulou[3]; E. Tsouma[4]; A. Alexiadou[4]; S. Plyta[4]

*[1]Cancer Hospital of Athens "Saint Savvas", Greece; [2]General Chest Diseases Hospital of Athens "SOTIRIA", Greece; [3]Children's Hospital Athens "Agia Sofia", Greece; [4]Cancer Hospital of Piraeus, "METAXA", Greece*

**Objectives:** Worldwide, lung cancer is the most common malignancy among men and the first cause of death. Among women, it is the third most common malignant disease and the second cause of death after breast cancer. Bronchoscopy, like most invasive methods, has contraindications, so it is not always possible to obtain cell samples with a bronchial brush or a tissue biopsy. Our objective was the evaluation of 632 results of cytological examination of bronchial washing samples in order to highlight the incidence of lung cancer types and their correlation with smoking.

**Methods:** Retrospective study of the results of the cytological examination of the year 2017, the results of the cytological examination of 632 bronchial washing samples. The average age was 57.3 years (19–90 years). The specimens were processed with the liquid-base cytology technique (Thin Prep®) and stained with Pap technique. The type of tumors was classified according to their morphological and immunocytochemical criteria.

**Results:** Of the 632 cases, 534 were negative for malignancy. In 62 (63.2% men) cases the diagnosis was malignancy and more specifically: squamous carcinoma in 26 (42%) related to 21 active or former smokers, adenocarcinoma in 9 (14.5%) related to 4 active or former smokers, small cell carcinoma in 4 (6.4%) related to 2 active or former smokers, non-small cell carcinoma in 20 (32.2%) related to 13 active or former smokers, while 3 (4.9%) cases were metastatic carcinomas (1 active or former smoker). In 36 cases, the diagnosis concerned cells atypical or suspected of malignancy (22 active or former smokers).

**Conclusions:** From our results, it appears that the most common type of lung cancer is squamous cell carcinoma and concerns about three out of four active or ex-smokers followed by small cell carcinoma and adenocarcinoma which account for about half of active or former smokers.

## P9-4 | Results of Cytological Examination of Bronchoscopies and Correlation of Lung Cancer Types with Smoking. A 1-year Retrospective Study

N. Koufopoulos[1]; K. Kosmas[2]; G. Mitropoulou[3]; E. Tsouma[4]; A. Alexiadou[4]; S. Plyta[4]

*[1]Cancer Hospital of Athens "Saint Savvas", Greece; [2]General Chest Diseases Hospital of Athens "SOTIRIA", Greece; [3]Children's Hospital Athens "Agia Sofia", Greece; [4]Cancer Hospital of Piraeus, "METAXA", Greece*

**Objectives:** Worldwide, lung cancer is the most common malignancy among men (1.241.600) and the first cause of death (1.098.700). Among women it is the third most common malignant disease (583.100) and the second cause of death (491.200) after breast cancer. The treatment of lung cancer and patient survival is based on the knowledge of both the extent of the disease and the type of carcinoma. Our objective was the evaluation of 579 results of bronchoscopy specimens for the detection of the incidence of lung cancer types and their correlation with smoking.

**Methods:** Retrospective study of 2017 results of bronchoscopy specimens from 579 patients. The average age was 57.2 years (30–85 years). The specimens were processed with the liquid-base cytology technique (Thin Prep®) and stained with Pap technique. The type of tumors was classified according to their morphological and immunocytochemical criteria.

**Results:** Out of 579 cases, 399 were negative for malignancy. In 138 (71% men) cases the diagnosis was malignancy and more specifically: squamous carcinoma in 42 (30.5%) related to 31 active or former smokers, adenocarcinoma in 25 (18.1%) related to 13 active or former smokers, small cell carcinoma in 16 (11.6%) related to 9 active or former smokers, non-small cell carcinoma in 45 (32.6%) related to 29 active or former smokers, 10 (7.2%) were metastatic carcinomas (2 active or former smokers). In 42 cases the diagnosis concerned atypical cells or cells suspected of malignancy (25 active or ex-smokers).

**Conclusions:** From our results, it seems that the most common type of lung cancer is squamous cell carcinoma and concerns three out of four active or ex-smokers followed by adenocarcinoma and small cell carcinoma which account for about half of active or ex-smokers.

## P9-5 | Idiopathic Pulmonary Hemosiderosis (IPH) on Bronchoalveolar Lavage Cytology Complemented with Cell Block Preparation: Two Case Reports in an Older Age Groups

A. El-Habashi[1]; A. Aly[1]; Y. Hamdy[2]; Y. Akl[2]

*[1]National Cancer Institute, Cairo University, Egypt; [2]Faculty of Medicine, El-Kasr, El-Eni, Cairo University, Egypt*

**Objective:** Diffuse alveolar hemorrhage (DAH) is a rare and life threatening condition characterized by hemoptysis, dyspnea, and alveolar infiltrates on chest radiograph and various degrees of anemia. DAH can occur as a primary disease of the lungs; idiopathic pulmonary hemosiderosis (IPH) or secondary to cardiovascular or systemic disease. The etiology of IPH is still unclear. The disease most commonly affects children in 80% and young adults in 20%. The diagnostic value of BAL smear cytology supplemented with iron special stain on cell block preparation has been demonstrated in two case reports of IPH.

**Patient's and Methods:** The first case was a 19 years old female, presented with progressive shortness of breath that started 2 years ago together with occasional cough with blood tinged sputum, fatigue and persistent anemia that was not corrected by blood transfusion. The second case was a 16 years old male who was missdiagnosed at the age of five to have G6PD deficiency anemia. He was subjected to attacks of fever, dyspnea occasional blood tinged sputum during these attacks.

**Result:** In the first case, high resolution computed tomography scan (HRCT) showed ground glass opacity, nodules, reticuklations and cysts. A list of differentials diagnoses was rendered in descending order that include hypersensitivity pneumonitis, NSIP, AIP and others. BAL. with cell block preparation showed numerous hemosiderin laden macrophages that confirmed by cell block Pearl's stain for iron as well as lung biopsy. Idiopathic Pulmonary Hemosiderosis diagnosis was rendered after exclusion of all secondary cause. The second case presented with recurrent anemia, acute progressive dyspnea, hypoxemia which indicated admission in Internal medicine ICU in our hospital. Hematologists were in doubt of his previous G6PD deficiency diagnosis. Then he was referred to chest disease unit upon his CT chest findings. HRCT findings were highly impressive of Hypersensitivity Pneumonitis diagnosis, which is the most common type of ILD we observed in our community and supported by the history of exposure. FOB and BAL cytology was performed. BAL cytology demonstrating increased numbers of hemosiderin-laden macrophages (>40% of total number of macrophages) that confirmed by Pearl's (Prussian blue) iron stain. BAL fluid specimens were negative for routine bacterial, mycobacterial, fungal, and viral as well as Pneumocystis stains and cultures. Diagnosis of IPH was confirmed after exclusion of all secondary causes.

**Conclusion:** The highly variable clinical presentation of PH often leads to a delay in its diagnosis as in our two cases. The classical triad of anemia, hemoptysis and pulmonary infiltrates is rare in characteristic features for IPH. Due to lack of pathognomonic findings, IPH diagnosis can be conclusively established upon exclusion of all other possible secondary causes of DAH along with BAL cytology rich in hemosiderin laden macrophages complemented by cell block preparation and Prussian blue Iron stain.

## P9-6 | Role of Endobronchial Ultrasound Guided Transbronchial Needle Aspirate (EBUS) in Molecular Marker Analysis in Lung Carcinoma

M. Perez-Machado; O. Nosseir-Marzouk; T. Rotimi
*Royal Free Hospital, University of London, UK*

**Objectives:** Molecular analysis in non small cell carcinoma paved the way to personalized therapy targeting specific genetic mutations. Endobronchial ultrasound (EBUS) fine needle aspiration and radial-probe EBUS-guided methods has proved reliable in diagnosis and/or staging of lung cancer. The objective of this study was to assess the role of these minimally invasive samples in molecular marker analysis.

**Methods:** Specimens of 195 consecutive patients who had Endobronchial ultrasound guided transbronchial needle aspirate (EBUS) for diagnostic lung pathology at the Royal Free London NHS Foundation Trust between November 2016 – November 2017, were collected from the WinPath Laboratory Information Management System in the Royal Free Hospital. Data were analysed in Excel spreadsheet and its statistics module.

**Results:** Analysis of our data showed that out of the 195, twenty nine cases (15%), were inadequate for initial cytological assessment, fifty four cases (28%) showed nonspecific reactive features, fifty five cases were granulomatous (28%) and fifty seven cases (29%) were malignant. The malignant cases were classified into: 27 adenocarcinoma (47%), 10 squamous cell carcinoma (18%), 17 neuroendocrine neoplasms (30%), two cases were lymphomas (3%) & one case mesothelioma (2%).

Molecular analysis was feasible using EBUS fine needle aspirates in 54% of lung tumours currently amenable to molecular testing, 15 out of 27 adenocarcinomas and 5 out of 10 squamous cell carcinoma cases. (The samples which were not sent for testing were either inadequate or molecular testing was carried out on the biopsy specimen).

**Conclusions:** In our series, molecular marker analysis using EBUS fine needle aspirations, was feasible in 54% of suitable lung tumours. Raising awareness about the optimum utilisation of these minimally invasive samples, liaising with the bronchoscopist and introducing rapid onsite evaluation could be beneficial.

## P9-7 | Current Utility of Citology in the Diagnostic of Pneumoconiosis

M. Gené; T. Muntal; I. Laboa; R. Ballester; I. Kopvseva; M. A. Carrasco
*Hospital Universitari General De Catalunya*

Pneumoconiosis is an occupational lung disease associated with the exposure of silicon particles or crystaline silica, among others. The penumonoconiosis incidence has drastically decreased in developed countries since the middle of 20th century due to protection

measures and the decreaded industrial dust emissions. However, new cases are still diagnosed in immigrant patients, people who suffered an exposure many years ago, or those who have an unusual clinical presentation.

We present three male patients, 38, 47 and 62 years old, all of them with history of exposure to asbestos, who have radiological tests with findings that are not conclusive in the lung, with large mediastinal and paratracheal lymph nodes. One of the patients also presented a large supraexternal abscessed mass. We performed BAL and pulmonary biopsy in the three cases, and endobronchial ultrasound-guided transbrochial needle aspiration (EBUS) of mediastinal lymph nodes in two patients. In the material extracted for EBUS, were found abundant macrophages and lymphocytes at different maturation stages. The sample was studied with polarized light that allowed to identify crystals compatible with silica. Cristaline silica were identified in BAL in patient that EBUS was not performed. Pulmonary biopsies were compatible with pneumoconiosis in the three cases.

Nowadays the diagnosis of pneumoconiosis rarely requires evidence of pathological tests. The history of exposure to silicon and radiological tests are sufficient to make the diagnosis. Only the macrophage count in the BAL along with the respiratory function tests and radiological tests help us to establish the stage and evolution of the disease. However, we would like to emphasize the role of cytology, especially EBUS, in the exclusion of other diseases that may have a similar clinicoradiological presentation, like tuberculosis and neoplasms.

## P9-8 | Asbestos Bodies Detection Through the Thinprep 2000 Processor in Digested Paraffin Blocks of Lung Tissue

A. R. Pastor; R. M. Perez Diaz; M. J. Martín Osuna
*Hospital Universitario "Principe de Asturias" Alcalá de Henares, Madrid*

**Objective:** Asbestos bodies, also called ferruginous bodies (FB), are detectable in different biological samples but paraffin blocks, also called formalin-fixed paraffin-embedded (FFPE), are the only sample that is filed and in which FB can be detected even tens of years after obtaining the sample. The usual FB detection technique with polycarbonate filters, after dewaxing and chemical digestion of the FFPE is laborious and time consuming. We developed a short and easy cytological method of FB detection through the ThinPrep 2000 processor.

**Material and methods:** FFPE is dewaxed, then fragmented, and placed in a test tube with a 10% sodium hypochlorite solution. Using a mechanical stirrer, the digestion process can be significantly shortened. By chemical digestion process, fragments of tissue disappear, and the material is performed in a centrifuge (5 min at 1500 rpm). The supernatant is discarded and re centrifuged with commercial liquid medium of the liquid cytology machine, in order to clean up possible remains of hypochlorite. The supernatant is again discarded and bottom material collected in the liquid cytology container.

**Results:** Using as control a FFPE from lungs with a known load of asbestos of 1000 FB per gram of dry lung tissue, we obtained cytological smears with a clean background and several easily identifiable FB. The use of the machine for liquid-based cytology can counteract the problem of dirty background and shortens the final process to obtain the cytologic smear.

**Conclusions:** Having a technique that allows the easy identification of FB in the FFPE archives is key to develop retrospective studies, since the FFPE are filed in the Pathology Departments for decades. The study of FB in archived FFPE has medico-legal implications on asbestos victims with a dubious history of occupational exposure.

## P9-9 | Sould the BAL Findings Be Considered in Smoking- Related Interstitial Lung Diseases (ILDs)?

B. Colom Oliver[1]; P. Carrillo García[2]; F. Salvá Ramonell[1]; A. Quiñoa Salanova[1]; M. A. Muñoz Vidal[3]
*[1]Servei d'Anatomia Patològica. Hospital Son Llàtzer. Palma de Mallorca. Spain; [2]Servei d'Anatomia Patològica. Hospital Universitari Son Espases. Palma de Mallorca. Spain; [3]Servei de Pneumología. Hospital Son Llàtzer. Palma de Mallorca. Spain*

**Clinical case:** 35 years/old woman, smoking 40 cig/day. With 48–72 h progressive worsening, cough, dyspnea, fever up to 38.5°C.

CT: extensive bilateral ground glass in upper lobes, poorly defined areas of peripheral condensation.

BAL count: 69% macrophages, 15% lymphocytes, PMN 11%, eosinophils 5%.

80% of the macrophages showed intracytoplasmic deposits of golden pigment, without usual hemosiderin deposits (negative Perls), diastase-resistant PAS. No microorganisms seen.

In a note, it is indicated that the findings are unspecific, can be observed in different entities such as desquamative interstitial pneumonia, smoker's bronchiolitis, post-obstructive pneumonia, deposits/drugs or in Usual Interstitial Pneumonia.

Biopsy is recommended, showing a slight interstitial thickening, without fibroblastic foci, alveolar spaces collapsed by histiocytes similar to BAL. CD1a and Ziehl-Neelsen, negative.

In this clinical-radiological context, the findings point towards a desquamative interstitial pneumonia (DIP), although they can also be seen in respiratory bronchiolitis-pulmonary interstitial disease (RB-ILD)

**Conclusions:** Several macrophages in the lung often represent an incidental finding, while in other cases, macrophages are the problem.

The accumulation of yellow-brown, haemosiderin-laden, pigmented macrophages ("smokers' macrophages") within respiratory bronchioles lumens/into the peribronchiolar alveolar spaces, is seen in smokers. In heavy smokers, alveolar accumulation determine an ILD affecting upper lobes with centrolobular nodules and ground-glass opacities at CT. Is RB-ILD when subpleural alveoli are not involved and DIP when the entire lobule is involved. They represent a

spectrum of histological lesions secondary to the macrophages accumulation into the peripheral lung zone, and secondary to cigarette smoking (also called "smoking-related ILDs"). In most cases, RB-ILD and DIP show a relatively stable clinical course with long-term outcomes and good prognosis.

It's important to underline that RB-ILD and DIP represent exclusion diagnoses, and may be observed concurrently in other diseases: lung cancer, idiopathic pulmonary fibrosis.

Diagnosis on small biopsy or BAL may be considered only in an adequate clinicoradiologic context.

## P9-10 | Cytologic Diagnosis of Bronchial Tuberculosis – Report of 3 Rare Cases and Their 6 Year Follow Up

T. Mamaladze; L. Mikiashvili; D. Tchkonia; G. Lursmanashvili; Z. Avaliani; R. Aspindzelashvili

*National Center for Tuberculosis and Lung Disease, Tbilisi, Georgia*

**Objectives:** A definitive diagnosis of TB in smear negative cases is often complicated and delayed. Cytology is one of the main tools for diagnosis mycobacterial infection in a rapid and cost-effective manner. Aim of the study is to present three smear negative rare cases of bronchial TB where diagnosis was established cytopathologycally.

**Methods:** All three patients were admitted at National Center for Tuberculosis and Lung Disease (NCTLD) in 2012: a 20-year-old man and two-28 and 31 years old women. Bronchial brush and wash samples were obtained from the lungs and underwent cytopathological examination. Diagnosis of TB was established when group of epithelioid histiocytes and Langhans giant cells were found in the samples.

**Results:** Bronchial wash bacteriological examination was positive for M.tuberculosis in two from three cases. 20-year-old man phybro bronchoscopy had been carried out: right B8b segmental bronch tumor formation.Cytopathologycally revealed tuberculosis granuloma, confirmed diagnosis. After undergo a course of antituberculosis chimiotherapy made significant improvements.

**Conclusions:** In high TB prevalence countries every single case should be investigated in depth, using all available methods. According of the present study, the cytologic criteria for diagnosis pulmonary and bronchial tuberculosis are traditionally the accuracy and utility. Five year follow up are without relaps. It is interesting study the cytopathology reaction of bronchial epithelium to the TB intoxication.

## P9-11 | BAL Cytology in the Differential Diagnosis of Lung Diseases

E. Kikidou; K. Savvidou; H. Sarlanis; S. Soussouris; A. Paraskeva; P. Mikou

*"Laiko", General Hospital, Athens, Greece*

**Objective:** The aim of this study was to assess the contribution of BAL (Broncho-Alveolar Lavage) cytology in the differential diagnosis of various lung diseases.

**Materials and Methods:** Our study included BAL samples of 62 patients with lung disease, during a two month period (October-November 2017). BAL fluid was processed and the cytospins were stained by Papanicolaou, Giemsa, PAS, Grocott, Perls, Ziehl-Neelsen according to clinical request. Immunocytochemistry for CD4, CD8, CD1A, TTF1 or other was also performed in appropriate cases. Finally, morphologic evaluation and cell type count were performed.

**Results:**

- 59.7% were female.
- The biggest age effect was in the 7th decade.
- Clinicians requests for differential diagnosis were in 38% infection/opportunistic infections, 12% NSIP, 11% Malignancy, 8% Sarcoidosis, 8% TBC, 7% Eosiniphilic pneumonia, 5% Pulmonary fibrosis, 5% BOOP and 6% various pulmonary diseases.
- 96.5% of the samples were negative for malignancy and 3.5% positive for malignancy.
- From the negative for malignancy cases 5.1% occurred in infection without recognition of specific microorganism [PAS (-), Grocott (-), Ziehl-Neelsen (-)], 1.7% presence of PC [PAS (−), Grocott (+)], 3.4% presence of Fungi [PAS (+), Grocott (+/−)], 5.1% hemorrhage [Perls (+)], 1.7% Fungal infection companied with hemorrhage [PAS (+), Perls(+)], 1.7% Fungal infection [PAS (−), Grocott (+)], 1.7% presence of Ferruginous bodies [PAS (+), Grocott (+/−)], 1.7% presence of Cryptococcus, 1.7% Sarcoidosis (CD4:CD8 = 0.85) and 1.7% Histiocytosis X [CD1A(+)].
- From the positive for malignancy cases, 2 (50%) were bronchoalveolar carcinoma, 1 (25%) B-NHL, 1 (25%) CLL and bronchial adenocarcinoma [TTF1(+)].

**Conclusion:** BAL cytology combined with clinical and imaging information is a useful tool in differential diagnosis of various lung diseases.

## P9-12 | Diagnostic Value of Bronchoalveolar Aspirate Before and After Bronchial Biopsy in Patients with Pulmonary Neoplasm and Endobronchial Lesion

L. Luizaga; F. Perez-Ochoa; M. Martinez; J. Sanz; L. Esteban; P. Pontes; L. Garcia; R. Albero; C. Gonzalez; X. Tarroch

*Hospital Universitari Mutua Terrassa*

**Objectives:** Bronchial biopsy (BB) is the procedure that has shown the highest diagnostic performance. Nevertheless, the bronchoalveolar aspirate (BAS) increases the diagnostic rate. It's considered that the BAS post-biopsy (BAS-POST) may contain malignant cells that

are shed from the tumor during the BB, and therefore be more cellular than the BAS pre-biopsy (BAS-PRE). We evaluate the diagnostic performance of the BAS-PRE and BAS-POST in a cohort of patients with pulmonary neoplasm and endobronchial lesion.

**Methods:** Prospective study, with 144 patients (113 men and 31 women), between 58–73 years of age (mean 65), from 2012 to 2016 with bronchoscopy for PN, with EL, performing BAS-PRE, BB and BAS-POST. We analyzed the performance in the diagnosis of PN: (i) Global bronchoscopy, (ii) BB, BAS-PRE and BAS-POST separately, and (iii) BAS-PRE and BAS-POST together. All procedures were compared by Pearson chi square test.

**Results:** The overall performance of the endoscopic procedures was 80.5%. The BB was diagnostic in 112 (77.8%) patients. The cytological techniques BAS-PRE and BAS-PRO provided the diagnosis in 4 (2.7%) cases in which the BB was non-diagnostic. The BAS-PRE was diagnostic in 24 (16.7%) of the cases while the BAS-POST was diagnostic in 33 (22.9%) of the cases. BAS-PRE was the only diagnostic procedure in 2 (1.3%) cases and BAS-POST was the only diagnostic procedure in 2 other cases (1.3%). Comparing the number of diagnoses obtained, BAS-POST obtains more diagnoses than BAS-PRE $p \leq 0.0001$

**Conclusions:** BAS techniques increases the diagnostic performance of the BB. The BAS-POST has higher performance than the BAS-PRE. There are cases in which the BAS-PRE and BAS-POST cytology were the only method that has obtained the diagnosis of neoplasia.

## P9-13 | Initial Experience in Cell Block Preparation of Bronchial Brushing in the Diagnosis of Lung Cancer

Z. Risteska[1]; Ž. Kušen[1]; H. Frketić[2]; S. Horvat[3]; S. Tominić[3]; R. Rubeša Mihaljević[1]; C. Štemberger[1]

[1]*Department for clinical cytology, Clinical Hospital Center Rijeka,Croatia;*
[2]*Department of pathology, Clinical Hospital Center Rijeka, Croatia;*
[3]*Department of pulmonology, Clinical Hospital Center Rijeka,Croatia*

**Introduction:** Cytological analysis of bronchoscopic samples is a relatively rapid and reliable method for the diagnosis of malignant pulmonary lesions. One of the most commonly performed technique in our laboratory is the bronchial brushing method. Considering the fast development of modern therapeutic options that depend on the molecular subtype of lung cancer, in order to standardize the procedures and further increase the diagnostic yield from the cytology specimen cell block method was introduced. The aim of this study was to assess the utility of cell block preparation from bronchial brushing.

**Method:** The cell block method was done according to the agar method. During bronchoscopy smears of bronchial brush are prepared before cutting the tip of the brush with scissors and placing it in a tube with 10% formalin. Cells are separated from the brush tip by rubbing it on each other and rinsed with 10% formalin. The sample obtained is further centrifuged for 5 min at 3000 rpm. The gel previously prepared by boiling saline and adding bacterial powder is added to the sediment and mixed with glass stick in order to achieve adhesion of cells and agar.Prepared cell blocks are stored at 4°C untill further hystological processing.

**Result:** The material obtained by bronchial brushing of 143 patients admitted for clinical suspicion of lung cancer was analyzed. The smears from each patient were reviewed and the cellularity of cell blocks determined. In 87 patients the material obtained by cell block technique was satisfactory for further immunohystochemical analysis.

**Conclusion:** Cell block preparation of bronchial brushing by agar method is a simple and helpful procedure to get additional material for immunohistochemical analysis. It should be considered as a reliable and complementary approach to conventional cytology procedures, in order to fulfill the requirements of high-quality diagnostics.

**Keywards:** cytology, bronchial brush, cell block

**Contact person:** zristeska@gmail.com

## P9-14 | Endobronchial Ultrasound-Transbronchial Needle Aspiration for Lymphoma in Patients with Mediastinal Lymphadenopathy

J.-H. Nam; C.-S. Park; G.-E. Kim; S.-S. Kim; Y.-D. Choi

*Chonnam National University Medical School, Gwangju, Republic of Korea*

**Objectives:** Surgical excision and core biopsy are the current preferred sampling techniques for diagnosing lymphoma. However, In patients who present with intrathoracic adenopathy that is suspicious for lymphoma, endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is an attractive option.

**Methods:** The cases of patients who had undergone EBUS-TBNA for 31 cases of suspected lymphoma were retrospectively reviewed.

**Results:** EBUS-TBNA diagnosis was that: 6 cases was diagnostic lymphoma, but not subtyping, 6 cases was specific lymphoma using cell block (2 cases of diffuse large B-cell lymphoma, NOS, 1 case of mantle cell lymphoma, 1 case of NK-T cell lymphoma, 1 case of anaplastic large cell lymphoma, and 1 case Hodgkin lymphoma), 5 cases was granuloma, 4 cases carcinoma, 6 cases diagnostic lymphoid tissue without specific diagnosis, and 4 cases non-diagnostic. Of 31 cases, 14 (45.2%) were finally diagnosed with lymphoma. In EBUS-TBNA, these cases were diagnosed as lymphoma (12 cases) and non-diagnostic (2cases). Other diagnosis in EBUS-TBNA was not finally diagnosed as lymphoma.

**Conclusions:** EBUS-TBNA is effective at diagnosing suspected lymphoma in patients with mediastinal lymphadenopathy. A specific EBUS-TBNA features, such as granulomas and carcinoma, are associated without a probability of lymphoma.

## P9-15 | Mediastinic Lymph Node Study Undergoing EBUS-TBNA. Review of 181 Cases

A. Ferran; M. R. Escoda; N. Combalia; L. Nebot; R. Orellana; C. Blázquez; J. Gallardo; J. Cugat; E. Monsó; J. C. Ferreres

*Parc Taulí Hospital Universitari, I[3]PT. Universitat Autònoma de Barcelona. Sabadell, Barcelona, Spain*

**Objective:** To evaluate utility of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) in mediastinal staging in lung cancer.

**Methods:** Retrospective review of 181 EBUS-TBNA cases performed with rapid on-site evaluation (ROSE technique) in our hospital from January 2015 to December 2016.

**Results:** From 181 cases performed, 107 (59.11%) were negative for malignancy, 73 (40.33%) were positive and 1 (0.56%) was considered unsatisfactory for evaluation. Among cases with positive lymph nodes, 7 were diagnosed as metastatic non-pulmonary primary neoplasm and 66 as pulmonary primary carcinoma, 60 of which corresponding to N2 or N3 (representative sample from stations 2R, 4R, 4L or 7): 24 adenocarcinoma, 11 squamous cell carcinoma, 13 non-small cell lung carcinoma and 12 small cell carcinoma (discarding surgical option), and 6 cases corresponding to N1 (representative sample from stations 11R or 11L): 2 adenocarcinoma, 3 squamous cell carcinoma and 1 non-small cell lung carcinoma. Mediastinoscopy and posterior surgery were performed in 3 cases, confirming lymph node involvement in surgical specimen (N1). Among cases with lung cancer and negative lymph nodes, in 37 was performed posterior mediastinoscopy, showing positivity in 5 cases (1 N1 and 4 N2) and surgery was performed in 32, showing positivity in 7 cases (5 N1 and 2 N2)

**Conclusions:** EBUS-TBNA can be successfully applied in diagnosis of a high number of lung cancer with N2 stage, avoiding unnecessary surgery. EBUS-TBNA and mediastinoscopy combined approach can reduce false negative cases.

The low percentage of cases unsatisfactory for evaluation is due, partly, to ROSE technique.

## P9-16 | Cell Block Analysis of Lymph Node Aspirations and Bronchial Washings in the Diagnosis of Lung Cancer

R. Rustamov[1]; E. Al-Nemnem[2]; S. Lang[2]; I. Petersen[1]

*[1]Institute of pathology and; [2]clinic for pneumology and oncology, SRH Wald-Klinikum, Gera, Germany*

**Objectives:** Conventional cytology has limited ability to archive cells for ancillary tests. The cell block technique enables preservation of cells and small tissue fragments from a cytology specimen by processing the material into a paraffin block. In this study, a cytoblock technique based on the plasma-thrombin method was evaluated in comparison to histology for the diagnosis of malignant neoplasms in the lung.

**Methods:** Cases with paired cytological and histological samples (n = 34) of suspected malignancies from the lung and lymph nodes (Adenocarcinoma = 13, SCC = 10, other primary malignancies and metastases = 11) were retrieved from the archive. It consisted of cell block samples of bronchial washings/lavage (BL, n = 19) and lymph node aspirates (LNA, n = 15), as well as corresponding biopsies. The cell block protocol was based on the resuspension of the cell pellet within a limited volume of plasma followed by coagulation with thrombin, fixation in formalin and paraffin processing similar to histology. The study population was male predominant 25 (73.5%) with the age of patients ranging from 50 to 87 years.

**Results:** The BL cell blocks revealed tumor cells in 12 out of 19 cases (63.1%). LNA samples were positive in 13 from 15 cases (86.7%). The final diagnoses were generally established by immunohistochemistry of the histological samples. However, the cytoblocks frequently showed as much tumor cells as the histology samples and were available for molecular testing and this was done in single cancer samples with limited tissue in the histological sample for the analysis of critical therapeutic biomarkers like PDL1 or ALK.

**Conclusions:** This study indicates that the cell block technique was not more sensitive than histology for the detection of cancer in the lung. Advantages include the assessment of an additional sample volume and the possibility for unlimited storage and molecular testing.

## P9-17 | Importance of the Presence of Citopatólogo In Situ in the Realization of Fiberglass Guided by EBUS and Fibrobroncoscope

N. Lopez; R. Rios; B. Rueda

*University Hospital Complex, Granada, Andalucia, Spain*

**Introduction:** EBUS is a minimally invasive technique of recent implantation that with fibrobronchoscopy allows to perform cytological punctures or extrabronchial directed biopsies for the diagnosis and staging of bronchopulmonary lesions, avoiding costly and invasive surgical techniques such as mediastinoscopy.

**Objectives:** Demostration of the diagnosis and economic profitability of FNAB-EBUS and fibrobroncospias with in situ expert cytopathologist for the immediate evaluation of the samples, valid for the morphological, immunocytochemical and molecular tests of bronchopulmonary and non-pulmonary pathologies with mediastinal involvement.

**Methods:** Retrospective study of 209 cytological punctures guided by EBUS or fibrobronchoscope with in situ cytopathologist in 2017 in our hospital, performing modified Giemsa staining and in situ

assessment of them, including cell blocks and deferred ICQ for typing certain lesions.

**Results:** Of the total, 108 correspond to FNAB-EBUS and 101 through fibrobronchoscopy, with 5 unsatisfactory for the first and 8 for the second, making a total of 13 unsatisfactory, with an important diagnostic correlation of cytology with those obtained in the biopsy or later surgical piece, both in the definitive diagnoses and in the different techniques performed, mainly in primary pulmonary pathology.

**Conclusions:** PAAF-EBUS and FNAB-FIBROBRONCOSCOPY are minimally invasive techniques with high diagnostic yield, mainly when performed with in situ cytopathology, proving to be very effective in the diagnosis of both bronchopulmonary and non-pulmonary lesions and adenopathies suspected of lymph node metastases of origin not pulmonary.

To obtain the maximum benefit, it is necessary the participation of pulmonologist bronchoscopists experts in these techniques, in order to obtain adequate material, increasing its effectiveness with the presence of cytopathologist in situ for morphological study and subsequent complementary techniques, thus reducing in significant numbers the unsatisfactory cytologies.

## P9-18 | Primary Pulmonary Malignant Melanoma: A Case Report and Literature Review

J. L. Sanz Trenado[1]; R. L. Perez[2]; J. V. Correllano[1]; F. R. Calatayud[1]; I. M. De Lara Simon[1]; P. M. Pavon[1]; L. G. Lopez[1]; V. H. Montoro[1]; J. G. Garcia[1]; C. R. Rodriguez[1]

*[1]Hospital General Universitario De Ciudad Real; [2]Complejo Hospitalario Universitario de Albacete*

**Introduction:** Primary melanoma of the lung is an extremely rare pathological entity and few cases had been reported in the literature. Extracutaneous melanoma represent just as few as 5% of melanomas and involvement of the lung is normally due to metastasis

**Methods:** Proposed features of primary melanoma of the lung were reviewed and matched with our case: A solitary lung tumour., Invasion of the bronchial epithelium by melanoma cells. No history of a cutaneous, mucous membrane or ocular melanoma. Absence of any other detectable tumour at the time of diagnosis.The clinical, radiological and cito-histopathological features are discussed.

**Results:** A 73-year-old male with hemoptysis as initial symptom. The chest radiography showed a round opacity of the lower left lung. The computed tomography of the chest revealed a well-demarcated mass lesion in that area. A fine needle aspiration was conducted, and diagnosis of melanoma of the lung was made supported by Melan-A and HMB45 positivity and CKAE1/AE3 and CD45 negativity, and clinical information. Patient underwent pneumonectomy and diagnosis was confirmed postoperatively after the immunohistochemistry. Primary nature of the tumour in the lung resultsfrom the demonstration of characteristic junctional pattern of melanoma cells beneath thebronchial epithelium on histopathology, and from exclusion of other potential primary sites in theclinical, paraclinical and laboratory examination.

The smear showed poorly cohesive cells, with an epithelioid and spindled shape Cells showed cytoplasmic vacuoles, eccentric placement of nuclei, nucleoli, nuclear pseudoinclusions, and melanin.

**Conclusions:** Clinico pathological correlation is critical to stablish an accurate diagnosis due to unnespecific specifity of citology among a primary tumor and metastasis.

## P9-19 | Haemostatic Agent in Fine Needle Aspiration, an Unusual Finding

S. Hernández Bonilla; P. López-Ferrer; A. M. Rodriguez; P. González-Peramato; O. B. Popescu; E. Palacios; B. Vicandi

*Hospital Universitario La Paz, Madrid, Spain*

**Objectives:** A variety of haemostatic agents are routinely used to control intraoperative bleeding in many surgical areas. In practice bioabsorbable hemostats, as oxidized cellulose, are often left in the surgical bed to prevent rebleeding after surgical closure. This haemostatic agent has been reported at first time in a neurosurgery patient with brain tumor and suspected of tumor recurrence.

**Methods:** We reviewed the citological files of fine needle aspiration of mediastinal nodes by EBUS of IN our hospital between march 2011 and december 2017. In this period 1035 mediastinal regions have been done out of 847 patients by EBUS. We have detected the presence of this hemostatic agent in 3 patients (in 5 FNA). In the same period of time 742 FNA of salivary gland have been done and we have detected the presence of this hemostatic agent in 2 patients (2FNA).

**Results:** The five patients were previously diagnosed with lung cancer (3) and salivar gland malignant tumor (2) and received surgical treatment. In a radiological follow up study all patients showed suspicion of recurrence. All cases were diagnosed of *granulomatous inflammation*, and *foreign body* giant cell *reaction* and *no evidence of malignancy* by FNA. All citological samples showed the presence of hemostatic agent characterized by a laminated acellular material, *intense basophilic* staining and positive PAS staining. One of the patients presented tumor recurrence. Those findings, once correlated with clinical and radiological information, approach us to the diagnosis of haemostatic material.

**Conclusions:** The presence of this material in cytology is unusual. In the literature there are few cases reported. It is important to know it to establish a correct diagnosis along with the rest of the medical and surgical information.

## P9-20 | Is a Specific Cytologic Diagnosis of Pulmonary Alveolar Proteinosis Possible? A Report of Five Cases

P. Muñoz-Hernández[1]; A. Urquía[1]; C. Gordillo[1]; P. Caballero[1]; C. Valenzuela[1]; O. Rajas[1]; J. Fraga[1,2]; J. A. Jiménez-Heffernan[1,2]

[1]*University Hospital La Princesa, Madrid, Spain;* [2]*Labco Pathology, Madrid, Spain*

**Objectives:** Pulmonary alveolar proteinosis (PAP) is a rare disease characterized by alveolar accumulation of acellular surfactant, probably due to an imbalance between its production and elimination. Histologically, PAP is defined as abundant, amorphous and eosinophilic proteinaceous periodic acid-Schiff positive material. Reflecting its rarity few cytologic descriptions are available. Our main purpose is to highlight the characteristic features of this entity that in our opinion can be specifically diagnosed on cytology. The recent commercialization of antibodies against surfactant increases the possibility of a specific cytologic diagnosis.

**Methods:** Five BAL specimens from five patients with a diagnosis of PAP were reviewed. On all cases Papanicolaou and Diff-Quik stained smears were available. The five cases had a histologic diagnosis and in one cytologic specimen an ultrastructural study was performed. Results

In all cases cytological examination showed a characteristic image with a variable number of well-defined, rounded to oval globules of dense amorphous material. The size of these globules varied between 20 to 60 μm. They stained dark with Diff-Quik and greenish to partially orange with Papanicolau stain. These globular structures were immersed in a dense, granular proteinaceous background with a variable number of macrophages. Grossly, the material obtained was milky in two cases. In the other ones there were no descriptions. All patients had respiratory symptoms and radiological findings characteristic of PAP.

**Conclusions:** The overall cytologic pattern observed in BAL specimens from patients with PAP is very characteristic and allows a precise recognition. The presence of the above mentioned globules in a granular background creates a very distinctive image. The diagnosis can be confirmed by ultrastructural analysis or immunocytochemistry against surfactant protein avoiding unnecessary biopsies. BAL examination can be particularly useful during the follow-up of these patients.

## P9-21 | Does It Worth to Insist on Necrotic Sputum Samples? 2 Rare Metastatic Cases

M. E. Pérez Martín; P. Callejo Pérez; P. I. González Márquez; D. González González; D. Colinas Reyero; M. C. González Barrera; J. M. Pigazo Merino; B. Madrigal Rubiales; T. Zamora Martínez; M. A. Torres Nieto; M. C. López Represa; C. A. Arroyo Domingo; A. Cerezo Hernández

*Hospital Universitario Río Hortega. Valladolid, Spain*

As a result of the strange diagnosis metastatic pleomorphic liposarcoma in a sputum with necrosis, because of insisting on Cytology and exhausting the material making a cell block, the following revision was done.

**Objective:** Review the tumoral necrosis in sputum samples.

**Methods:** All sputum samples with the only diagnosis of necrosis from year 1990 to 2016 with code SNOMED T2Y030 and M54000 (23 cases corresponding to 22 patients) and all subsequent cytologies and clinic history were reviewed retrospectively in the Río Hortega Hospital.(Valladolid, Spain).

**Results:** More than a half (13 cases) were tumor necrosis. Among them, 84.6% corresponded to primary carcinomas of the lung (23.1% adenocarcinomas, 46.1% squamous and 15.4% poorly differentiated large cell carcinomas) and 15.4% (2 cases) were metastases (1 of gastric origin and 1 liposarcoma). In all cases of pulmonary origin, the diagnosis was made in posterior cytologies (serial sputum or pleural fluid) with less necrosis and a greater number of tumor cells. In the case of metastases from gastric origin, the diagnosis was made by performing IHC on the extensions (We did not have liquid cytology at that time). In the case of sarcoma, it was absolutely essential to deplete the material by performing a cell block for IHC study, in spite of the necrosis without malignant cells watched in the first slide.

**Conclusion:** It is advisable to repeat sputum cytologies with necrosis and cell block realization of the remnant for an adequate diagnosis of possible primary or metastatic tumors.

## P9-22 | Cytologic Features of Pulmonary Langerhans Cell Histiocytosis in Bronchial Washing: A Report of Two Cases

S. Y. Ha[1]; M. H. Kang[1]; M. S. Roh[2]

[1]*Gachon University Gil Medical Center, Incheon, Republic of Korea;* [2]*Dong-A University College of Medicine, Busan, Republic of Korea*

**Objectives:** Pulmonary Langerhans cell histiocytosis (PLCH) is a rare disease characterized by proliferation of CD1a-positive Langerhans cells. Because lung biopsy is performed for diagnosis in most cases, the cytologic findings of PLCH are not fully described. We present the two cases of cytologic features of PLCH in bronchial washing.

**Results:** The first case involved a 55-year-old male patient who presented with cough, myalgia and febrile sensation. He was 30 pack-years current smoker. The second case involved a 48-year-old female patient who presented exertional dyspnea for 5 months. She was 10 pack-years current smokers. The smear of bronchial washing showed high cellularity. Most of cell types were histiocytes, with indistinct cell border having abundant cytoplasm, occasionally prominent nucleoli, irregular nuclear contour and grooves. These cells were accompanied by lymphocytes, alveolar macrophages, multinucleated giant cells, and a few eosinophils. On immunocytochemical

stains, 8% of cells were positive for CD1a and S-100 protein. The possible pulmonary histiocyte-rich lesions include respiratory bronchiolitis (RB), desquamative intestinal pneumonia (DIP), Rosai-Dorfman disease (RDD), and Erdheim-Chester disease (ECD).

**Conclusion:** The possible diagnosis of PLCH can be made by considering the characteristic cytologic findings with the patient smoking history and using the immunocytochemistry.

## P9-23 | The Role of Cell Block Cytology in the Diagnosis of Malignant Pleural Effusions

Ž. Kušen[1]; R. Rubeša Mihaljević[1]; Z. Risteska[1]; H. Frketić[2]; K. Matušan Ilijaš[2]; C. Štemberger[1]

[1]*Department of Clinical Cytology, Clinical Hospital Center Rijeka, Croatia;* [2]*Department of Pathology and Pathological Anatomy, Clinical Hospital Center Rijeka, Croatia*

**Introduction:** The cytological examination of pleural effusions has been well-established method. It helps in staging, prognosis and management of patients with malignancies. Therefore cell blocks prepared from pleural effusions can be used as adjuncts for establishing a more precise cytopathological diagnosis. The aim of this study was to asess the utility of the cell block method in the cytological diagnosis of malignant pleural effusions.

**Methods:** The cell block obtained from pleural effusion were done using Agar method. The pleural effusion is centrifuged for 5 min at 3000 RPM. After decanting, 2 ml of 10% formalin is added to the sediment and the material kept for 4–24 h at room temperature for fixation. The material is afterward centrifuged for 5 min at 3000 RPM in order to separate formalin and agar gel is added to the sediment. Preparing of agar gel consists in boiling of 0.9% saline which is added to bacteriological powder, mixed to make crystals disappear and cooled to 450°C. Mixing the material with a glass stick makes cells bind to the gel. The cell block obtained is stored at 40°C and ready for further processing as histological material suitable for immunohistochemical and molecular analysis.

**Results:** In this study among a total of 85 malignant pleural effusion 56 were further processed to cell blocks. In 43 cases a definitive diagnosis could be achieved by cell block cytology using immunohistochemistry. Ancillary molecular testing for prognostic parameters were performed on cell blocks in 11 cases.

**Conclusion:** The preparation of cell blocks from pleural effusion has confirmed to be a simple safe and cost-effective procedure that can improve cytological diagnosis and increase the usage of the material for further analysis.

**Keywords:** pleural effusion, cytology, cell block

**Contact:** zeljka.kusen@gmail.com

## P9-24 | Usefulness of the Investigation of Macrophages with Hemosiderin in Bronchoalveolar Lavage (BAL)

A. Rocher; A. Angeleri; F. Guerra; C. Gimenez; L. Palaoro

*Universidad De Bs As, Htal De Clinicas Jose De San Martin*

**Introduction:** Siderophages are macrophages in which the presence of hemosiderin can be identified by immunocytochemical techniques, observed in BAL between 48 and 72 hours after bleeding, persisting between 2 and 4 weeks after the initial bleeding.

**Objective:** To determine the utility of the presence of macrophages with hemosiderin in alveolar hemorrhage (AH). Correlate the percentage of siderophages with the pathology causing AH.

**Materials and Methods:** In 50 patients with suspected AH, the bronchoalveolar lavage (BAL) cytological study was performed, which included total and differential cell counts, and the investigation of hemosiderin-loaded macrophages by the Perls reaction. For the Perls technique, equal parts of an aqueous solution of 2% potassium ferrocyanide and 10% hydrochloric acid were used. The positivity of the reaction was evidenced by a deep blue precipitate inside the macrophages. The percentage of siderophages was determined, considering the cutoff point for alveolar hemorrhage> 20%. The definitive diagnosis was evaluated with the patient's clinical history. Statistical methods: Student parametric and nonparametric Mann-Whitney test ($p < 0.05$: significant).

**Results:** The investigation of macrophages with hemosiderin was positive in 76% of the samples with diagnosis of AH. The sensitivity of the method was 97% and the specificity 85%. Perls positive samples were classified according to the definitive etiological diagnosis in autoimmune diseases (AD), infectious diseases (ID) and miscellaneous (M) (neoplasms, coagulopathies, severe respiratory disorders). We determined the percentage of Siderophages in each subgroup (mean-$\mu$ and standard deviation-SD), observing significant differences between the AD ($67.85 \pm 21.70$) and ID ($70.31 \pm 19.23$) with M ($50.71 \pm 12.04$) ($p < 0.005$), however, no significant difference was observed between AD and ID.

**Conclusions:** The research of macrophages with hemosiderin in BAL is a useful tool in the diagnosis of alveolar hemorrhage due to the speed of execution and the simplicity of its interpretation that leads to an effective medical behavior.

# P10 CYTOTECHNOLOGY

## P10-1 | A New Cytology Staining Method

P. Melo[1]; F. Ferreira[1]; F. Schmitt[2]

[1]*Instituto Universitário de Ciências da Saúde, Paredes, Portugal;* [2]*Faculdade de Medicina da Universidade do Porto, Portugal*

**Introduction:** Cytology has been used as a method of detection and screening of malignant and pre-malignant lesions showing their potential since the original works of Papanicolaou.

Usually, the cytological smears are stained with the original Papanicolaou (Pap) staining, despite of being time consuming and requiring a large amount of reagents.

**Objective:** The aim of this study is to assess the quality of an original Blue Stain® staining in exfoliative smears to compare with the standard Papanicolaou stain.

**Methods:** In this study, we analysed 800 samples of exfoliative cytology collected from cervix and oral cavity. The cytological samples were selected randomly, two slides prepared from each patient simultaneously, in order to compare two different staining methods. One of the smear was stained by standard Papanicolaou Stain and the other slide was stained by Blue Stain®.

**Results:** In this study the staining quality was compared in both methods and the diagnoses concurred in difference cases in the paired smears and the pathologists encountered no difficulties in the interpretation of the smears stained by the Blue Stain®. Compared with the Papanicolaou staining, the time taken to stain each bunch of slides can be reduced from 20 to 3 min and costs are reduced by 70%.

**Conclusions:** Blue Stain® allows staining cytologies with high quality standards at a reduced cost and time when compared to the Papanicolaou method.

## P11 BREAST CYTOLOGY

### P11-1 | Fıbromatosıs of the breast. Report of a Case

E. Tsouma[1]; M. Nifora[1]; K. Kosmas[2]; A. Papanastasiou[1]; N. Koufopoulos[3]; E. Arkoumani[1]; A. Alexiadou[1]; S. Plyta[1]

*[1]Metaxa Cancer Hospital, Piraeus, Athens, Greece; [2]General Chest Diseases Hospital of Athens «Sotiria», Athens, Greece; [3]Cancer Hospital of Athens Saint Savvas*

**Objectıve:** Fibromatosis of the breast is a rare histopathological entity with an incidence less than 0.2% of all mammary tumors, associated with previous trauma. Patients with mammary fibromatosis range from 13 to 80 years at diagnosis, with an average of 37 years. Usually, patients present with a single non-tender palpable mass of 0.3–15 cm in diameter and retraction of the skin may be seen. Mammography shows a speculated mass, suspicious for carcinoma. Breast ultrasound (U/S) and MRI are more sensitive.

**Methods:** We present a case of mammary fibromatosis in a 60 year-old woman who presented in our hospital with a mass in the right breast. The patient mentioned a previous surgery in the area nearby, for the excision of a benign cyst. Mammography showed a nodular shadow and U/S revealed a hypo-echoic mass (1.8 cm) with smooth margins (BIRADS 4C). FNA and FNB were performed on the breast mass. The cytology preparation showed low cellularity and consisted mainly of dispersed spindle cells and a few cell aggregates. Some areas of collagen matrix were found, admixed with spindle cells. The epithelial component was absent.

**Results:** The cytological diagnosis was negative for malignancy, identifying probably a fibroblastic type of lesion. Complete excision of the lesion was recommended in a way to exclude other entities. The histological result of the FNB was desmoid type fibromatosis.

**Conclusion:** The mammary fibromatosis is an unusual entity and it's not surprising that a few examples have been subjected to needle aspiration or core biopsy procedures. We report this cause because of its rarity in cytological material.

### P11-2 | Hormone Receptors AND HER2 Expression in Fine Needle Aspirates from Metastatic Breast Carcinoma in Kuwait – Role in Patient Management

K. Kapila[1]; R. Al Temaimi[1]; B. Al Ayadhy[1]; M. Jaragh[2]; F. Mothafar[2]; P. Alath[2]; S. S. George[1]; I. Francis[1]

*[1]Faculty of Medicine, Kuwait University; [2]Hussain Makki Juma Centre for Specialised Surgeries, Kuwait*

**Introduction:** Estrogen receptors (ER), progesterone receptors (PR) and epidermal growth factor (HER2) are important prognostic factors which dertermine management of breast carcinoma. In our study we determined them by immunohistochemistry (IHC) on cell blocks from fine needle aspirates (FNA) of metastatic breast carcinomas to axillary lymphnodes and compared them with that reported in the primary breast carcinoma (PBC). The aim was to document any change in the expression of ER, PR and HER2 in the metastatic tumor which would guide future management.

**Methods:** ER, PR and HER2 by IHC and HER2 oncogene by Fluorescent in-situ hybdridisation [FISH] were studied on cell blocks of FNA of axillary lymphnodes in 53 of 94 cases of PBC in HMJCSS during 2013–2016.

**Results:** In 25 of 38 (65.8%) ER,PR+ PBC the metastasis on FNA was ER,PR+ while all the 15 (28.3%) ER,PR- PBC remained negative in the metastatic tumor. In 10 of 11 (91%) of HER2-IHC+ PBC the metastatic tumor was positive for HER2-IHC. In 7 of 32 (21.9%) HER2 negative PBC, HER2-IHC was positive in the metastatic tumor. HER2-FISH was performed in 37 cases on FNA which included 27 equivocal and negative cases of HER2 on FNA and ten HER2+, ER, PR- cases by IHC on FNA. Six of 37 were HER2 amplified/positive while 9 and 19 remained equivocal and negative for HER2 copy number and 3 were not interpretable. All the HER2-FISH positive cases were positive by IHC. In our study, 34.2% of ER,PR+ cases of PBC became ER, PR- in the metastatic tumor and 21.9% of HER2-IHC negative PBC were HER2-IHC+ in the metastatic aspirate.

**Conclusion:** ER, PR and HER2 by IHC in cell blocks of metastatic lymphnodes is reliabile. Change in receptor (34.2%) and HER2 status (21.9%) documented is of clinical significance as these patients warrant a change of management.

## P11-3 | Cytologic Diagnosis of Lymph Node Breast Cancer Metastasis

F. Tresserra; G. Fabra; M. Castella; C. Fernnadez-Cid; M. A. Martinez
*Hospital Universitario Dexeus, Barcelona, Spain*

**Objective:** Fine Needle Aspiration (FNA) has been widely used as an important tool in the determination of status of locoregional lymph nodes during the initial staging and subsequent management in patients with breast cancer. When a metastatic involvement of the lymph node is detected the selective biopsy of sentinel lymph node can be avoided.

The aim of this study is to evaluate the metastasis detection rate in lymph node of breast cancer patients.

**Methods:** Retrospective observational study of 204 cases of breast cancer with histologically studied axillary lymph and previous FNA examination seen at our center from 2008 to 2017. Cases with in situ carcinoma and those with neoadjuvant chemotherapy were excluded from the study.

The detection rate of FNA according the type of metastasis was analyzed.

**Results:** From the 204 cases 103 (51%) were histologically and 61 (30%) cytologically positives.

The type of metastases were: ITC 5 (5%), micrometastasis 6 (6%) and macrometastasis 92 (89%). The detection rate of FNA was 61/103 (59%) and for those cases with only one positive node 26/53 (49%). Detection rate for ITC was 1/5 (20%), for micrometastasis 2/6 (33%) and for macrometastasis 23/42 (55%).

The sensitivity for metastasis detection of FNA was 64%, the specificity 100%, the PPV 100% and PNV 72%.

**Conclusions:** FNA has a good sensitivity for lymph node metastasis detection helping in the decision to indicate sentinel lymph node biopsy. It is also helpful for those lymph nodes with micrometastasis. Detection rate is higher when there is more than one involved lymph node.

## P11-4 | Cytologic Diagnosis Of Lobular Carcinoma Of The Breast

G. Fabra; M. Castella; C. Fernandez-Cid; M. A. Martinez; F. Tresserra
*Hospital Universitario Dexeus, Barcelona. Spain*

**Objective:** Invasive lobular carcinoma (ILC) is often multifocal, bilateral and is also associated with a the highest false-negative rate on fine-needle-aspiration (FNA) diagnosis among breast cancer which ranges from 15 to 60%. Diagnosis and correct classification of lobular carcinoma have a significant impact on prognosis and clinical management of the patient. The diagnostic problem of lobular carcinoma may be due to several factors, namely, inadequate sampling, intrinsic paucity of cells, interpretative error, and tumor-specific factors such as the characteristic low-grade atypia and small-sized cells. The aim of this study is to stablish the concordance rate of FNA in diagnosis of ILC.

**Methods:** Retrospective, observational study of ILC histologically diagnosed between 2008 and 2017 with previous FNA. The FNA posterior to October 2013 where performed using based liquid cytology (BLC). Concordance in diagnosis according techniques was evaluated.

**Results:** The mean age was 50 $\pm$ 10 (39–83) year-old. The false negative rate of FNA for diagnosis of ILC was 31%, being of 26% for conventional cytology and 35% for LBC. LBC diagnosed more ILC as benign and less as absence. One (2%) case of conventional cytology and 5 (7%) of LBC the lobular type of carcinoma was expressed in cytological diagnosis.

**Conclusions:** The FNA diagnostic for ILC has a high rate of false negative, and it is higher in LBC due to nuclear features of cytological samples with this method.

## P11-5 | Cell Block an Extra Helpful Tool in Breast Cancer

F. E. Marginean; M. Moreiro; L. Olsson; D. Grelaud; B. Ziemicka; K. Olafsdottir; Z. Wandzioch; R. Ehrnström
*Malmö Universtity Hospital, Skane, Sweden*

**Objectives:** Breast cancer treatment is based on the detection of Estrogen, Progesteron receptors and Her 2 protein. In some cases, the core biopsy is not possible but the so called cell block –mini-biopsi material can be provided from fine needle aspiration method. The aim of this study is to compare the results on the cells block material with core biopsy or lumpectomy or mastectomy material.

**Materials:** From 31 patients were taken cell block material from FNA of primary breast cancer or metastatic breast cancer in lymph node or other organs (liver) and done ER, PgR and Her2/SISH HER2. The results on the cells block material were compared with the biomarker in core biopsy or lumpectomy or mastectomy material.Only in 20 of cases the material in cell block was sufficient for the biomarkers.

**Result:** In these 20 cases 17 cases 100% the same results, in one case the material of mastectomy was after neoadjuvant treatment and the result was complete different. The other two cases the patients had palliative treatment and no material for compare.

**Conclusions:** Cell block can be used as an extra toll from detection of ER, PgR and Her 2 protein when the core biopsy is not available.

## P11-6 | Fine Needle Aspiration Cytology of Primary Breast Lymphoma. A Case Report

P. Zili[1]; A. Koliou[2]; C. Psachoulia[2]; N. Christodoulis[1]; Z. Stamou[2]; A. Moumouri[1]

*[1]General Hospital of Corfu, Corfu, Greece; [2]University Hospital of Patras, Patras, Greece*

**Objectives:** Primary non-Hodgkin lymphoma (NHL) of the breast is quite rare, representing 0.5% of all malignant breast tumors, 1% of all NHLs and 2% of all extranodal lymphomas. As for the lymphoid lineage, B-cell lymphomas of the breast are more common than T-cell lymphomas. In the present study, a case of primary breast lymphoma by fine needle aspiration is presented.

**Methods:** A 73 year old woman was presented to the General Hospital of Corfu with a painful, right breast mass at the upper, outer quadrant palpable for more than four months. During clinical examination the mass was mobile and had a diameter of about 4 cm but no axillary lymph nodes were found. A fine needle aspiration was performed and conventional smears, as well as liquid based specimens (Thin Prep) were taken. The prepared smears were stained with Papanicolaou and May-Grünwald Giemsa stains.

**Results:** Cytology examination showed the presence of isolated lymphoid cells mainly of large and intermediate sized cells with nuclear membrane indentations. Prominent nucleoli were rarely seen. Furthermore, many lymphogranular bodies were seen in the background. Positive immunocytochemistry staining for CD20 and CD23 was detected, but the expression was negative for cytokeratins and CD3. Based on the above findings, the cytological diagnosis was consistent with a primary B-NHL large cell type lymphoma and the followed histopathological diagnosis confirmed it.

**Conclusions:** The cytological diagnosis of primary breast lymphoma is effective, when the morphological, as well as, the immunostaining results are taken into account and may contribute to the patient's clinical treatment.

## P11-7 | Invasive Ductal Carcinoma Cytologic Grading

S. Musca Suhane[1,2]; D. Scripcaru[1]; V. Scripcaru[1]

*[1]Clinical Hospital Cuza Voda, Iasi; [2]CMI CITOS Dr Musca Simona*

**Objective:** The modern attitude towards the diagnosis of the mamary gland pathology is based on the triple test: clinical examination, imagistic and cytologic exams. The cytologic grading offers prognostic information holding practical value in the complex oncologic decision-making, especially for the neoadjuvant therapy cases.

**Methods:** The current study realized a retrospective evaluation of the mamary carcinoma cytologic grading scale corelated with the histologic staging after Scarf Bloom Richardson method modified by Elston and Ellis. The study group was composed of 50 smears, all from mamary carcinoma patients. The cases selection was based on the following principles: all diagnosis were histopathological confirmed (ductal invasive carcinoma NOS type), all smears were of the 5th class (classical malignancy cytologic criterias). Routine Giemsa staining was used.

**Results:** For the cytologic grading of the invasive ductal carcinoma we used the nuclear grading system Blake modified and Blake simplified. The following criterias were analised and cuantified: anizocaria, cromatinian model, nucleolus look, the number of mitosis and the nucleus dimensions. The additional studied cytologic parameters were: tumoral placard arhitecture, cell arrangement (tube-like disposition), cell dissociation degree and the necrosis presence/ absence. Blake modified/ simplified cytological grade was corelated with Elston and Ellis histological grade. The corelation was estimated at 90%. The statistic processing was realised by using the Spearman corelation test and allowed us to establish a hierarchy over each parameter influence.

**Conclusions:** The cytologic grading of the invasive carcinoma is an importand component of the cytologic diagnosis and holds a practical value especially for the patients that follows neoadjuvant therapy. The authors appreciate that determining the cytologic grade is based on a larger spectre of cytologic parameters, that only corelated can lead to a real conclusion.

## P11-8 | Comparison of Histological and Immunohistochemical Findings in Fine Needle Aspiration Cytology and Histopathology of Breast Malignancies

J. Faryna[1]; M. Pyzlak[2]; W. Olszewski[3]

*[1]Bielanski Hospital, Warsaw Poland; [2]Medical University of Warsaw, Warsaw Poland; [3]Maria Skłodowska Curie Memorial Cancer Centre and Institute of Oncology, Warsaw, Poland*

**Objectives:** Breast cancer is one of the most common malignancies in women worldwide. Most cases of breast cancer can be successfully treated as long as early and precise diagnosis (including immunoprofile of the lesion) is provided. Fine needle aspiration cytology (FNAC) is a cost effective diagnostic method of high specificity and sensitivity in breast pathology. Nevertheless it has largely been abandoned in favor of core needle biopsy which is regarded as superior in the context of immunoprofiling (especially for HER2 immunostaining).

Our purpose was to assess the utility of FNAC for the purpose of rapid diagnosis and immunoprofiling in the setting of a primary center managing breast lesions.

**Methods:** Our methods included classic FNAC with the use of alcohol-fixed, H&E stained slides, immunocytochemistry performed on unstained alcohol-fixed smears and immunohistochemistry with the use of FFPE samples after surgical removal of the tumors. The

immunoprofile included estrogen receptors (ER), progesterone receptors (PR); Ki-67 proliferation index and HER2 assessment.

We have studied a group of 92 women with breast lumps that referred to our center for primary pathological diagnosis of the lesion.

**Results:** We have managed to achieve good concordance between cytology and histology.

80% concordance for ER with mean percentage values significantly lower for cytology vs histology (70.1% vs. 75%, $p < 0.005$).

For PR the differences between percentage values were statistically insignificant (59.67 vs 62.39, $p = 0.8$).

Ki-67 percentage showed high concordance with no significant differences between cytology and histology (25.78 vs 25.86 $p = 0.91$).

HER evaluation showed concordance between 66% and 94%, depending on the score group (0, 1+, 2+, 3+), with the highest values for negative and 3+ group.

**Conclusions:** Our results showed that cytology can be successfully used in breast cancer diagnostics, not only as a triage for core biopsy, but also for immunophenotyping and treatment prediction.

## P11-9 | Ultrasound-Guided Fine Needle Aspiration of Axillary Lymph Nodes in Breast Cancer Patients: A Tertiary Centre Experience

T. Stoos-Veic[1]; N. P. Novak[1]; M. Skoro[1]; A. Mataic[2]; G. Ivanac[1]; C. Tomasovic-Loncaric[1]; K. Martic[1]; R. Zic[1]; E. Divjak[1]; B. Brkljacic[1]

*[1]University Hospital Dubrava, Zagreb, Croatia; [2]Community Hospital Varazdin, Varazdin, Croatia*

**Objectives:** Ultrasound guided FNA is currently used for preoperative assessment of axillary lymph node status of breast cancer patients. While it is known that sentinel node biopsy (SNB) is more sensitive than FNA, there is still controversy regarding sensitivities of CNB and FNA, most studies finding them comparable. Aim of this study is to present the results of US-guided FNA compared to postoperative histopathology of lymph nodes in breast cancer patients during the last three-year period in tertiary breast care centre.

**Methods:** Browsing the database of Pathology and Cytology Department in University Hospital Dubrava from January 2015 - December 2017, 96 patients with breast cancer that have both preoperative FNA and postoperative histology results available, were identified. The preoperative FNA were compared with postoperative histology results. Sensitivity, specificity, PPV and NPV were calculated.

**Results:** The total of 96 breast cancer patients underwent US-guided FNA of axillary lymph nodes during the three-year period. 42 patients had positive lymph nodes on preoperative cytology, while 52 were negative. All positive nodes were found to be positive on histology (0% false positive). Two patients had positive nodes preoperatively and were negative on histology after neoadjuvant chemotherapy and were excluded from calculation. Eleven patients were negative on preoperative cytology and had positive histology (21% false negative) and 10 patients had positive nodes on histology, but were not evaluated preoperatively with FNA. Thus, sensitivity of preoperative FNA was 80%, specificity 100%, negative predictive value (NNP) 79% and positive predictive value (PPV) 100%.

**Conclusion:** Due to its high specificity and PPV, US-guided FNA of axillary LN is an effective, simple and reliable method for preoperative evaluation of ALN status, thus helping the patient management. Regardless, when preoperative FNA is negative for malignancy, SNB should be performed, since it has reportedly better sensitivity.

## P11-10 | Hodgkin Lymphoma Mimicking Breast Carcinoma, Diagnosed by US Guided FNAB

E. Thodou[1]; G. Triantafyllidis[2]; M. Befani[3]; T. Horeftaki[4]; A. Feritsean[5]; D. Papadaki[6]

*[1]Private Cytologist, Volos, Greece; [2]Private Radiologist, Volos, Greece; [3]Private Hematologist, Volos, Greece; [4]G. Genimmatas, General Hospital, Athens, Greece; [5]Achillopouleion General Hospital, Volos, Greece; [6]Evangelismos, General Hospital, Athens, Greece*

**Objectives:** Hodgkin lymphoma involving the breast is very rare. We report a case of Hodgkin lymphoma presented as breast lesion, clinically mimicking inflammatory carcinoma, associated with axillary lymphadenopathy, diagnosed by fine needle aspiration biopsy (FNAB)

**Methods:** A 65-yrs old woman presented with signs of inflammation and lymphedema with orange skin appearance of the right breast, and a palpable mass of the ipsilateral axilla. Mammography did not detect a breast lesion, but showed enlarged lymph nodes in the right axilla. FNAB of the lymph node was first attempted elsewhere; cytology report was suspicious for carcinoma. Subsequent blind core biopsies of the breast did not reveal malignancy. A CT scan also disclosed enlarged infraclavicular lymph nodes on the right side. By ultrasound (US) we identified a round hypoechoic lesion in the right breast, partially ill defined, measuring 6 mm in maximal diameter. We performed US guided FNAB in the breast lesion and in the axillary lymph node block. Rapid on site evaluation (ROSE) of the specimens was performed using Hemacolor stain. The remaining slides were stained with Papanicolaou stain.

**Results:** The cytomorphology of both lesions was identical. We observed scattered large atypical lymphoid cells among a population of small lymphocytes and eosinophils. The atypical lymphoid cells showed faint basophilic cytoplasm and large nuclei with prominent nucleolus. Some cells were binucleated displaying features of Reed-Stenberg cells. A non epithelial neoplasm, consistent with Hodgkin lymphoma was reported. Immunostains for Pan keratin, LCA and CD30 performed on cytology smears, further supported the diagnosis. Histology and immunoprofile of an excised axillary lymph node confirmed the cytological diagnosis.

**Conclusions:** Regardless the overwhelming clinical presentation, FNAB proved to be a valuable tool for the accurate diagnosis. This is however true, when evaluated by experienced cytopathologists, especially using the ROSE method.

## P11-11 | Cytologic Features of Breast Peri-Implant Papillary Synovial Metaplasia

A. Freih Fraih[1]; P. Muñoz Hernández[1]; C. Bárcena[2,3]; N. Conejero[2]; J. A. Jiménez Heffernan[1,2]

*[1]University Hospital La Princesa, Madrid, Spain; [2]Labco Pathology, Madrid, Spain; [3]University Hospital Doce de Octubre, Madrid, Spain*

**Objectives:** Synovial metaplasia is a peculiar form of metaplasia seen in the inner lining of the fibrous capsule that surrounds breast implants. The cause of this particular type of metaplasia seems related to chronic movement of the implant. Since the description of breast-implant associated anaplastic large cell lymphoma it is increasingly common to receive periprosthetic breast fluid collections for pathologic analysis. The purpose of this report is to describe a case of breast-implant papillary synovial metaplasia that showed remarkable cytologic findings. A review of the medical literature revealed one previous cytologic description.

**Methods:** A 53 year-old woman underwent surgery because of capsular contracture of textured, silicone breast implants. A peri-implant fluid collection was present in one of the prostheses. During surgery 5 ml of fluid were drained and submitted for cytologic examination. Similarly, the fibrotic capsules were submitted for histopathologic analysis.

**Results:** The fluid was dense and smears showed abundant mucoid material that distributed on the background as a thick layer often showing a wrinkled, "plastic food wrap" pattern. Macrophages and small droplets of silicone were also present. The most relevant finding was the presence of numerous ball-like, three-dimensional spherical structures with a very well defined contour. Their morphology and cellular details were much better appreciated in Papanicolaou stained smears. Larger spherules showed nuclear crowding in the centre. Nuclear details were better visualized in the smaller ones that showed round to oval morphology with no significant pleomorphism. The cytoplasm was dense with ill-defined limits. In the outer part of the spherules oval to spindle nuclei, parallel to the surface were evident.

**Conclusions:** In our opinion cytologic features of breast related synovial metaplasia reflect what is seen on histology and are characteristic enough to permit a specific recognition. The pathologist must consider this diagnostic possibility whenever evaluating breast peri-implant fluid accumulations.

## P11-12 | Fine Needle Aspiration of Metastatic Melanoma to the Breast: Case Report and Literature Review

G. G. Yange Zambrano; J. Martín López; J. Martínez-Echevarría Gil-Delgado; J. B. García Reyero; M. Martino González; M. A. Revuelta Montoya; M. L. Cagigal Cobo

*Hospital Universitario Marqués de Valdecilla, Santander, Spain*

**Objective:** Secondary tumors in the breast represent 1.3–2.7% of all malignant mammary tumors. The mammary gland can be a site of metastasis in patients with malignant melanoma. The clinicoradiological presentation can be interpreted as benign lesion either as a primary tumor. Fine needle aspiration citology (FNAC) may simulate a broad spectrum of malignancies but confirm the metastatic origin. The recognition avoid unnecessary treatment such as chemotherapy and indicate surgical treatment.

**Method:** To report a metastatic melanoma we describe the clinicopathological details of one case and review the frequency of secondary tumors in the breast and the utility of FNAC.

**Results:** A 25 year old woman with melanoma previously diagnosed in the left lower limb present unilateral breast lesion which on ultrasound examination was considered hypoechoic with demarcated margins. Radiologically was classified as benign and FNAC was performed. The smears showed dispersed neoplastic cells with occasional epithelioid morphology. The nuclei were round to oval with prominent nucleoli and exhibited a moderated cytoplasm without melanin pigment. Immunocytohistochemistry was positive for Melan-A, S100 and negative for cytokeratin. Final diagnosis of metastatic melanoma was performed and the patient was surgically treated.

**Conclusion:** Fine needle aspiration is a rapid, accurate, and minimally invasive procedure that is useful in the diagnosis of metastatic melanoma. Patients with a positive cytology can proceed directly to surgery.

# P12 EFFUSIONS CYTOLOGY

## P12-1 | Extramedullary Hematopoiesis Presenting as Unilateral Pleural Effusion: A Case Report and Review of Literature

S. Segura; G. Ramos-Rivera; S. Khader; S. Maleki

*Montefiore Medical Center, the Bronx, NY, USA*

**Introduction:** Extramedullary hematopoiesis (EMH) is a compensatory hematopoietic tissue response in various malignant and benign conditions. Pleural effusion (PLE) related-EMH is a rare event with few cases reported.

**Case presentation:** A 72-year-old man with 2-year history of primary myelofibrosis (PMF) (JAK-2 V617F mutant) and hepatosplenomegaly presented with dyspnea and fatigue. Imaging

revealed a new right-sided PLE, and thoracentesis yielded serosanguineous fluid. Analysis of the fluid revealed exudative features and numerous megakaryocytes (CD61 positive), findings consistent with EMH. Microbiology studies were negative and peripheral blood flow cytometry showed no evidence of acute leukemic transformation. He was symptomatically treated and discharged home on hydroxyurea and a right pleural space catheter for drainage. A month later, the patient returned with persistent pleural fluid accumulation.

**Discussion:** EMH generally involves the reticuloendothelial system; however, it may also occur in other organs. Possible explanations for body cavity EMH include: (i) manifestation of a myeloproliferative disorder, (ii) bone marrow replacement by neoplastic or non-neoplastic processes, and (iii) leakage of marrow through a defective bony cortex as in Paget's disease of the bone. While most cases of PLE-EMH occur in the setting of myelofibrosis, it has also been noted in other hematologic, non-hematologic and hemolytic disorders. PLE-EMH is usually exudative and unilateral, with few bilateral cases reported. Myeloid elements suggest PMF. Various therapies for PLE-EMH management have been used with limited long-term efficacy. While hydroxyurea successfully treats EMH in other sites, previously reported cases of PLE-EMH were refractory to said treatment, chemotherapy, or surgery, ultimately requiring pleurodesis or low dose radiotherapy.

**Conclusion:** An early and accurate identification of hematopoietic elements in effusions should be recognized as a potentially life-threatening entity in clinical practice. Although not many cases of PLE-EMH have been reported in the literature, its presence has been associated with progression of underlying disease and poor prognosis.

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## P12-2 | Incidence of Soft Tissue and Bone Tumor Malignancy in Effusion Cytology. A 16-Year Review at Our Institution

M. Policarpio-Nicolas; J. Reith
*Cleveland Clinic, Cleveland, Ohio, USA*

**Objective:** The incidence of malignant bone and soft tissue tumors in effusion cytology is extremely rare with only a handful of case reports in the literature. The goal of this study is to perform the largest and most comprehensive study of bone and soft tissue malignancy occurring in effusion cytology and correlate the clinical findings if available.

**Method:** A natural language search using CoPath (pathology information system) was performed for 2000–2016. The database included cytopathology case number, age, gender, cytological diagnosis and the classification of malignancies. When available, the clinical follow-up was included in the result.

**Result:** Of the 20,091 effusion specimens from 2000 to 2016, 3,374 (17%) were positive for malignancy (pleural = 2,265, peritoneal = 955, pericardial = 154 pericardial). A total of 964 cases of known primary malignancies (pleural = 649, peritoneal = 269, and pericardial = 46) were identified. There were only 14 malignant pleural effusion positive for 11 sarcomas (2 PNET, 2 synovial sarcoma, 2 Undifferentiated sarcoma, 2 MPNST, 1 Rhabdomyosarcoma, 1 Angiosarcoma and 1 Fibromyxoid sarcoma), 1 Epithelioid hemangioendothelioma and 2 malignant bone tumors (2 osteosarcoma). There was a slight male predominance (M = 8, F = 6). Age range was 18–73. No pericardial or peritoneal fluid involvement by malignant soft tissue or bone tumors were identified. Available follow-up on 10 patients from the time of cytology diagnosis showed death from disease in <1 month (5 cases), <12 months (4 cases) and 25 months (1 case).

**Conclusion:** The incidence of malignant soft tissue and bone tumors involving effusion cytology is extremely rare (<1%) with the pleural cavity as the most common site. A positive cytology appears to portend a poor prognosis given that approximately 90% of cases died in less than 12 months.

## P12-3 | Eosinophilic Synovitis, an Infrequently Observed Entity

B. Colom Oliver[1]; F. Salvà Ramonell[1]; P. Carrillo García[2]; A. Quiñoa Salanova[1]
*[1]Servei d'Anatomía Patològica, Hospital Son Llàtzer, Palma de Mallorca, Spain; [2]Servei d'Anatomía Patològica, Hospital Universitari Son Espases, Palma de Mallorca, Spain*

**Clinical case:** A 45-year-old woman with a history of chondromalacia patellar for whom she received an intraarticular injection of hyaluronic acid 1 month ago, goes to the emergency department for a painful knee and swelling.

In emergencies, left knee with tension joint is seen, without phlogosis. The liquid of arthrocentesis shows a normal appearance. The biochemical study denotes 3,500 cell/mm$^3$ with normal proteins, glucose and 6% eosinophils. The microbiological study does not object microorganisms. In the general blood analysis: slight leukocytosis and an increase of PCR 58.70 mg/l. No significant radiological findings.

The cytological study shows an abundantly cellular fluid, with mononuclear and polymorphonuclear cells, of which 15% are eosinophils.

**Case discussion and conclusions:** Synovial eosinophilia, the presence of eosinophils in any number in synovial fluid, is a rare finding, probably underestimated. Its etiopathogenesis is not completely known.

Secondary and idiopathic forms have been described. The idiopathic are not associated with known systemic inflammatory pathology, or with chronic non-inflammatory rheumatic pathology.

They can be pure or pseudoallergic, when they occur in patients with atopic background and or positive dermatographism. Both are usually large joints monoartritis with great joint effusion component but few phlogotic signs. Synovial fluid usually presents between 2,000 and 10,000 leukocytes/mm$^3$ with a variable percentage of eosinophils. Although a greater and a smaller form (±10% eosinophils) have been distinguished, both appear to have the same significance in terms of clinical and prognosis. Peripheral eosinophilia is an uncommon association and is not usually severe. Symptoms resolve in a few days without specific therapy and approximately half of them have recurrences. Intraarticular injection of hyaluronic acid is not associated in literature. Usually NSAIDs are enough to control the symptoms. Synovial eosinophilia has not been associated with the development of new joint deformities nor has it been described as a chronic form of arthritis.

## P12-4 | Cell Blocks and Diagnostic Utility in Peritoneal Fluid Cytology: An 8 Year Retrospective Analysis

M. Rathbone; D. Kermani

*North Middlesex University Hospital, London, UK*

**Objectives:** The purpose of study was to examine the role of cell blocks in the diagnosis of malignancy over an 8 year period in which their use increased from less than 9% to more than 99%. Ultimately, the purpose of the audit was to provide guidance on the appropriateness of the routine inclusion of a cell block with peritoneal fluid cytology.

**Methods:** A list of patients was generated identifying all cases recorded as "peritoneal fluid", "ascitic fluid" and "peritoneal washings" between 01/01/2010 and 31/12/2017. The reports for these cases were stratified according to several criteria, including benign vs. malignant, use of cell block, use of immunohistochemistry and ultimate diagnosis. The malignant cases with cell blocks were reviewed.

**Results:** The department reported 1,245 cases of peritoneal fluid cytology between 2010 and 2017. 183 (12.6%) were malignant, and 151 (12.1%) had cell blocks. As expected, the incidence of cell block usage increased from 9% in 2010 to 99% in 2017, during which time the number of malignant diagnoses doubled from 9% to 18%. Increased use of cell blocks and immunohistochemistry naturally increased the quality of the information given to the clinicians, with 87% of malignant cases in 2010 reported as adeno-/carcinoma NOS compared with only 13% in 2017. 129 of the malignant cases (85%) were reviewed and it was shown that 22% of these altered the cytological diagnosis (from reactive or suspicious to malignant).

**Conclusions:** We believe that our data has shown that the case for routine use of cell blocks in peritoneal fluid cytology is convincing: they are relatively quick and easy to perform, were shown to double our detection of malignant cases and provide additional information (subtyping) which in nearly a quarter of cases altered the cytological impression.

## P12-5 | T-Cell Non Hodgkin's Lymphoma (NHL) Primarily Diagnosed in Pleural Effusion a Case Report

P. Zili[1]; A. Koliou[2]; C. Psachoulia[2]; E. Christodoulis[1]; A. Moumouri[1]; M. Roumelioti[2]

*[1]General Hospital of Corfu, Corfu, Greece; [2]University Hospital of Patras, Patras, Greece*

**Objectives:** T-cell lymphoblastic lymphoma is an aggressive malignancy that represents 85% of all lymphoblastic lymphomas. It usually occurs in late childhood and young adulthood with 2:1 male predominance and commonly manifested with pleural effusion and symptoms from the respiration tract. A case of NHL (T-cell) primarily diagnosed in pleural effusion is presented.

**Methods:** A 19 year old man was admitted to the General Hospital of Corfu complaining for elevated fever, dyspnea, exhaustion and pain in the pectoral area. The followed thoracic Computed Tomography (CT) showed the presence of an enlarged mediastinal mass, as well as, a right pleural effusion. The aspirated pleural fluid was centrifuged and conventional smears in addition to liquid cytologic specimens (Thin Prep) were prepared and stained with the Papanicolaou stain.

**Results:** Pleural fluid examination showed cellular smears of a monomorphic, neoplastic population from small and medium sized lymphoid cells with high N:C ratio, dispersed chromatin, indistinct nucleoli and scant cytoplasm. A few mesothelial cells, neutrophils and eosinophils cells were also observed. The immunocytochemistry

staining for CD3 and CD5 antibodies was positive, for L26 was focally positive and for kappa/lambda light chains was negative. Cytological diagnosis based on immunostaining findings, were consistent with NHL (T-cell) type and the subsequent pleural biopsy confirmed it.

**Conclusions:** Effusion's cytology may contribute to the diagnosis of pleural NHL (T-cell) as well as to the patient's therapeutic regimen.

## P12-6 | Pleural Lavage Cytology (PLC) in Non Small Cell Lung Carcinoma (NSCLC). A 2-Year Single Institution Retrospective Analysis of 98 patients. Cell block (CB) Utility

R. Mazorra; M. Martino; M. A. Revuelta; C. Martinez; C. Azpiazu

*Valdecilla University Hospital, Santander, Spain*

**Objectives:** Lung cancer is a major cause of cancer related deaths in the Western world. Early detection of NSCLC and surgical resection are regarded as the mainstay to reduce mortality. However, the recurrence rate remains significant even with complete resection. One reason might be the exfoliated cells from the tumour in the pleural cavity. PLC during surgery is a simple method with the potential to detect microscopic spread. In this study, we describe our institution's experience with PLC over 2 year period and evaluate the utility of CB.

**Material and methods:** All PLC cases for the 2 year period between 2016 and 2017 were identified in our department. All correlating surgical pathology reports of subsequent lung specimens, patient's medical records and PLC smears and CB were review.

**Results:** A total of 192 PLC of 98 patients with NSCLC 72 men and 26 women (mean age 67 years, range 34–83). 96% had both pre and post-resection PLC. All with smears (27% representative), 92.7% CB (100% representative) and in 39.8% immunohistochemistry (IHC) panel was done. 67% were between IA and IIB stage. 93 patients (94.9%) had negative PLC, 46% with pleural invasion, 17% with vascular invasion and 29% more than IIB stage. 8 died. 5 patients had positive PLC, 3 pre and 2 post-resection. All had CB with IHC. They were between IIIA and IV stage, all had pleural and 3 vascular invasion. They are alive.

**Conclusions:** In our institution 5, 1% patients had a positive PLC with an advanced stage and pleural invasion. In the negative PLC, almost half of the patients had pleural invasion and a third an advanced stage. CB must be obtained as provided sufficient material for diagnosis and IHC panel in comparison to smears.

## P12-7 | Seasonal Appearance of Malignant Effusions in Adult Patients

M. Kardari[1]; P. Zili[2]; G. Christodoulis[2]; E. Chrisochoidou[1]; C. Mpota[1]; C. Psachoulia[1]

*[1]University Hospital of Patras, Patras, Greece; [2]General Hospital of Corfu, Corfu, Greece*

**Objectives:** The presence of malignant effusions in body cavities as a primary or secondary manifestation of the disease has a poor prognosis. The evaluation and correlation of a possible seasonal and racial manifestation of malignant effusions with their site of collection is presented.

**Methods:** 427 adult patients (234 males and 193 females) admitted to our hospital, because of a presented malignant effusion (240 pleural, 159 ascitic and 28 pericardial) in a 10 years period 2007–2017 were studied. The cases examined, were separated in two periods. The first period ranged between October 15th to April 15th (cold climate and shorter daytime duration) and the second one between April 15th and October 15th (warm climate and longer daytime duration). In the cases studied, the cytologic diagnosis included 389 metastatic adenocarcinomas regardless of the primary tumor's origin, 11 small cell carcinomas, 16 large cell carcinomas, 12 lymphoproliferative disorders and two melanomas.

**Results:** Ascitic malignant effusions showed a 40% female prevalence during the second period (warm climate and longer daytime duration), while a 50% male increase, statistically significant, was noticed during the first period (cold climate and shorter daytime duration). No remarkable seasonal deviation is noticed regarding pleural malignant fluids. Furthemore, a female greater predisposition was seen during the first period (cold climate and shorter daytime duration) in the few studied pericardial cases. No correlation with the cytologic diagnosis was found.

**Conclusions:** In the present study, the effusion-forming metastatic malignancies in body cavities of adult patients suggest a seasonal and racial correlation regarding to the ascitic and pericardial fluids, while no significant relationship to pleural malignancies was noticed.

## P12-8 | Positive TTF1 Staining in an Ascitic Fluid-Metastic Carcinoma from a Gynaecological Cancer not from a Primary Lung Cancer

J. Grace[1]; K. McIntyre[1]; J. Pickett[2]; S. Tiley[3]

*[1]NSW Health Pathology North, Gosford Hospital, Gosford, NSW, Australia; [2]NSW Health Pathology North, Royal North Shore Hospital, North Sydney, NSW, Australia; [3]Gosford Hospital, Gosford, NSW, Australia*

It is not always appreciated that carcinomas of ovary, cervix and uterus may stain with TTF1. This is often in association with positive neuroendocrine markers: chromogranin, synaptophysin and CD56. It is also associated with negative Ca125.

**Objectives:** To discuss the interpretation of malignant peritoneal fluids with positive staining with TTF1.

**Methods:** This is a case report from a 73 year old female who presented with ascites and a past history of a poorly differentiated carcinoma involving the ovary, fallopian tube and omentum.

The peritoneal fluid showed neuroendocrine features and high nuclear to cytoplasmic ratios. In the cell block, single cells predominated as well as scattered multinucleated cells lacking neuroendocrine features.

**Results:** Immunoperoxidase stains:

POSITIVE – TTF-1, CK7, CK8/18, synaptophysin, CD56, chromogranin (focal), WT1 (focal), p53 and progesterone receptor (scanty).

NEGATIVE – Ca125 CK20, oestrogen receptor, PAX8, napsinA, p63 and thyroglobulin.

The staining patterns in the cell block were variable and indicated several populations of cells. In particular the synaptophysin stain was strongly positive in the linear groups and single cells, however not in the multinucleated cells. The CK8/18 stain was strongest in the multinucleated cells and large single cells, and not in the linear groups.

Comparable staining patterns were found in the peritoneal fluid and the histology of the previous pathology involving the ovary, fallopian tube and omentum. PAX8 was positive however patchy and weak in the histological sample. There is still uncertainty if the original cancer arose from the ovary or the fallopian tube.

**Conclusion:** In malignant peritoneal fluids from a female patient, a positive TTF1 stain may not be evidence of lung origin, especially if associated with positive neuroendocrine stains. Further stains and comparison with any previous biopsies and/or clinical history should be evaluated to determine if the carcinoma is of gynaecological origin.

## P12-9 | Malignant Effusions in Patients with Renal Neoplasms

K. Savvidou; H. Kikidou; H. Sarlanis; I. Leotsakos; P. Mikou
*Laiko Hospital, Athens, Greece*

**Objective:** To report the rare incidence of malignant effusions occurring in patients with renal lesions.

**Methods:** During 2017 we have received 720 effusions, 185 of which have been diagnostic of malignancy. Four of the malignant effusions were associated to renal lesions.

**Results:** Case 1: Woman 62-year-old with renal mass on CT and pleural and peritoneal effusions, which were positive for malignancy on cytology. Immunocytochemistry (ICC) was positive for CD45 and negative for Pankeratin, TTF-1, neurospecific enolase (NSE), synaptophysin and epithelial membrane antigen (EMA). Combined cytomorphological and ICC findings favored a lymphoma diagnosis. Histology confirmed a high grade B-cell non-Hodgkin lymphoma.

Case 2: Man 71-year-old with renal mass and peritoneal effusion positive for malignancy exhibiting double neoplastic population. ICC displayed CD45 expression on dispersed malignant cells and EMA expression on malignant cell groups. Histology confirmed the co-occurrence of renal papillary carcinoma Type 1 (Fuhrman grade 2 and focally 3) along with diffuse large B cell lymphoma.

Case 3: Woman 65-year-old with renal mass and peritoneal effusion positive for malignancy, suggestive of renal adenocarcinoma. FNAB of the renal mass confirmed a clear cell renal carcinoma Fuhrman grade 3.

Case 4: Man 62-year-old with history of partial nephrectomy for mucinous tubular spindle cell renal carcinoma and peritoneal effusion positive for malignancy. ICC was focally positive for BerEp4, CD10, CK7 and Vimentin and negative for HBME-1 and Calretinin. Subsequent PET scan confirmed peritoneal metastasis.

**Conclusions:** Cytology by combination of morphology and ICC can be an accurate diagnostic tool in detecting metastatic malignancy in effusions from unusual primary tumours.

## P12-10 | Primary Effusion Lymphoma in a 40-Year-Old HIV-Positive Male Patient

R. M. Ríos-Pelegrina[1]; L. Roldán Mateo[2]; M. Caba Molina[1]; B. Rueda Villafranca[2]; A. Remón Love[3]; A. González Fábrega[2]; M. Gómez Morales[3]
*[1]Hospital de Baza, Granada, Spain; [2]Hospital Virgen de las Nieves, Granada, Spain; [3]Hospital del Campus de la Salud, Granada, Spain*

**Objectives:** Primary effusion lymphoma is a large B-cell lymphoma located in body cavities with non detectable tumor mass, which occurs predominantly in immunocompromised patients, especially HIV-positive ones, and it is associated with human herpesvirus 8 (HHV-8) infection. We present the case of a 40-year-old male patient, diagnosed with HIV infection 9 years ago and on antiretroviral therapy since 2011, who has a pericardial effusion with cardiac tamponade and subsequent associated pleural effusion.

**Methods:** Thoracentesis and cytological study of the extracted fluid were carried out; it was processed by using de Thin-prep® method for Papanicolaou stain and getting a cell-block with the supernatant.

**Results:** At smear and cell-block, it can be observed a lymphoid neoplasia formed by medium and large-sized cells with several prominent nucleoli, accompanied by numerous signs of apoptosis and some figures of mitosis. Immunohistochemical stains performed show that the neoplastic cells are positive for CD45, EMA and, heterogeneously, for CD138, CD7 and MUM-1. In contrast, the stains for CD20, PAX-5, CD79a, CD3, CD2, CD5, CD38, TdT, CD30, CD15, CD10, Bcl-6, Bcl-2, ALK, chromogranin A, cytokeratin AE1/AE3, CD56, mesothelin and TTF-1 are negative. The staining for human herpesvirus 8 is diffusely positive in the nucleus of neoplastic cells and the Epstein–Barr encoding region (EBER) in situ

hybridization is equally positive. The proliferative rate, determined by Ki67 staining, is high (>80%).

**Conclusions:** Despite the negativity of B-cell lineage markers and the CD7 expression, the PCR analysis by capillary electrophoresis demonstrates clonal IGK, IGH and IGL gene rearrangements, confirming that this is a B-cell neoplasm. Positivity of both Epstein-Barr virus and human herpesvirus 8 detection techniques is decisive on primary effusion lymphoma diagnosis. The patient is clinically stable and will receive chemotherapy treatment, which he has decided to postpone temporarily.

## P12-11 | Cellular Pellet of Pleural Effusions in the Determination of EGFR Mutations in Non-Small Cell Lung Carcinoma: Presentation of Data Obtained in a Series of 52 Cases

A. B. García; A. V. Falcón; M. del C. M. Corriente; C. G. Castro; Á. N. Deroy; Y. Q. Quintero; I. G. Villa; I. B. Fernández; E. S. Ruiz

*Hospital Universitario De Canarias*

**Objectives:** 15–20% non-small cell lung carcinomas (NSCLC), have EGFR mutations, showing sensitivity for targeted therapies. 70–80% NSCLC patients are diagnosed in late stages. In many cases, pleural effusions are the only available material for molecular testing. We present our experience on EGFR mutation screening in pleural effusions.

**Methods:** Our series includes 52 samples with an average percentage of tumor cells of 39.5%. DNA was purified from cell pellets by either silica columns or phenol-chloroform methods, yielding about 185 ng/ml DNA. The mutational study was carried out in an automated real-time PCR system (cobas). The average response time was 5 business days.

**Results:** Of the 52 cases, 50 were valid, 1 invalid and 1 inconclusive. 14 of them presented mutations (28% of the total): deletion of exon 19 (50%) and mutation L858R of exon 21 (43%) accounted for most of them and were relevant for treatment decisions. 86% of the mutations were observed in women. Similar percentage, 86%, were non-smokers mutants (92% of which were women). In the mutated group, the average age was higher in women (74 years vs. 65 years in men). All cases but one were diagnosed as adenocarcinoma (ADC). In 84% of the total group and in 86% of the mutated group, pleural fluid was the only material available for the test. The median survival was significantly higher in the mutated group (average 16.5 months) than in the non-mutated group (average 5.5 months).

**Conclusions:** Cellular pellet of pleural effusions, is useful for molecular testing. It is an alternative to other cytological materials, provided that parallel cytological analysis assures a good representation of tumor cells in the sample. In our series we observed a high percentage of mutations (28%), and corroborated the higher frequency of EGFR mutations in non-smokers women with lung ADC (79% of mutated group).

## P12-12 | Cytological Diagnosis of Pseudomyxoma Peritonei. An Uncommon Entity

E. Konstantinou[1,2]; S. Divani[1,2]; M. Tzikopoulou[1,2]; E. Papadimitriou[1,2]; A. Fericean[1,2]; A. Vardouli[1,2]

[1]*Department of Cytology and Pathology, Volos General Hospital;* [2]*Internal Medicine Clinic, Lamia General Hospital, Greece*

**Objective:** Pseudomyxoma Peritonei (PMP) or gelatinous ascites represents an accumulation of mucin within the peritoneal cavity. It is a rare event with incidence of one to two cases per million per year and mucinous neoplasms of appendix or ovaries are the main causes of this entity.

PMP if left untreated may cause the death of the patient mainly due to intestinal obstruction.

The aim of this presentation is to review our archives, find cases of PMP and compare them with histology and outcome of the patients.

**Methods:** The last ten years 3 cases of PMP were diagnosed in our Cytology Department, two in men and one in a woman.

The aspirated peritoneal material was in all cases little to moderate in amount and usually gelatinous as it was described in the cytological reports.

Thin Prep and conventional smears were reviewed and in all three cases there was an histologic confirmation.

**Results:** Two men, 63 and 77 years respectively, appeared with appendiceal mucinous neoplasms, low grade and the woman 48 years of age had synchronous ovarian and appendiceal mucinous tumors with high risk of recurrence. All had surgical treatment and the last one had also been treated with intraperitoneal chemotherapy during the second cytoreductive surgery.

The cytological smears revealed mucinous material, mesothelial cells, histiocytes and mucin-producing epithelial cells in variable numbers.

**Conclusion:** PMP is a rare entity that a cytopathologist must have in his mind since cytologic evaluation of a peritoneal fluid even with a small amount of mucin and rare mucin-producing tumor cells, may be the initial diagnostic test suggesting the presence of a mucinous tumor and PMP, guides the clinicians to further investigation of the patient and therapeutic managment.

## P12-13 | Pleural Effusion as Initial Symptom of T-All in a 5-Year-Old Boy

A. Sabio González[1]; R. M. Ríos-Pelegrina[2]; M. Caba Molina[2]; N. López López[1]; M. Narváez Simón[1]; C. González Núñez[3]; P. Becerra Massare[3]; M. Gómez Morales[2]

[1]*Unidad de Gestión Clínica de Anatomía Patológica, Hospital del Campus de la Salud, Granada;* [2]*Unidad de Gestión Clínica de Anatomía Patológica, Hospital de Baza;* [3]*Unidad de Gestión Clínica de Anatomía Patológica, Hospital Virgen de las Nieves, Granada*

A 5 years-old boy arrived at the emergency department due to 1 week of persistent cough, shortness of breath and weariness.

Physical examination revealed adenoidal enlargement, hyperemia, palpebral edema, tongue enlargement and bilateral cervical lymphadenopathies. Chest X-ray displayed a mediastinal mass, confirmed by TAC, which showed bilateral pleural effusion and mild splenomegaly.

The child underwent a pleural aspiration with the aim of reducing the symptoms and reaching a diagnosis. The fluid obtained was divided: less than a half of it was submitted to study by Flow Cytometry, the rest was processed by using the Thin-prep® method for Papanicolaou stain, and getting a cell-block with the supernatant.

The evaluation of the Pap stained smear was the first the pediatrician obtained. The smear was constituted by a heterogeneous cellular population of lymphoid appearance and with a significant atypia. These features suggested a lymphoid neoplasm as the first diagnostic possibility. This information allowed to start corticosteroid treatment in the same morning of patient's admission.

In the afternoon, was taken a bone marrow aspiration, that exhibited 82% lymphoid cells, of which 12% were immature and 70% displayed morphological anomalies.

Flow Cytometry of Pleural fluid cytology revealed 78% of blast cells, CD7, CD2, cytoplasmic CD3 and TdT positive and CD5, CD4, CD8, CD1a, CD20 negative.

Immunocytochemical study performed on cell-block confirmed Immunophenotype was the same of pleural fluid, bone marrow and peripheral blood.

Such changes were consistent with T-Lymphoblastic leukemia/lymphoma, an entity that account nearly 90% of LBLs, being more common in late childhood. This is usually detected by histological assessment of mass biopsies. Diagnosis only based on cytology is not recommended for lymphoid neoplasm, but even though pathologist must be able to evaluate it in order to start the treatment as faster as possible.

## P12-14 | The Pivotal Role of Cytological Examination of Peri-Implant Effusion in The Diagnosis of Breast Implant-Associated Anaplastic Large Cell Lymphoma (BI-ALCL): Report of 2 Cases

C. Scacchi; L. Chiapparini; E. Bresaola; G. Renne; C. Casadio
*European Institute of Oncology, Milan, Italy*

**Introduction:** Breast implant-associated anaplastic large-cell lymphoma (BI-ALCL) is a rare type of non-Hodgkin T cell lymphoma, CD30 positive and anaplastic lymphoma kinase protein (ALK) negative, occurring in late peri-implant effusion (seroma).

**Objectives:** To retrieve seromas from our files and describe the morphological features and immuno-cytochemical (ICC) profile of BI-ALCL in two cases.

**Methods:** From January 2015 to January 2018 a total of 38 peri-implant effusions were studied in our Institute. They were processed in monolayer (Thin Prep®) or cytospin slides and cell-blocks. In 6 cases ICC for CD30, CD4, CD8 and ALK expression was performed.

**Results:** Four samples were hemorrhagic, 31 were reactive mainly with foamy and/or multinucleated macrophages and granulocytes, 1 showed relapsing epithelial tumor cells; in two cases the diagnosis of BI-ALCL was rendered:

- Case one concerns a 26-years-old woman with a BRCA1 gene mutation and invasive ductal carcinoma of the right breast, who underwent bilateral breast mastectomy with simultaneous breast implants, in 2010. Five years later, she presented with effusion around the left breast implant.
- Case two concerns a 61 years-old woman who underwent a right mastectomy for invasive ductal carcinoma, in 2005, with simultaneous breast implant. In 2013, the implant was replaced with a new one and four years later (2017) she developed a seroma.

Cytological examination of monolayer prepared slides and cell block sections revealed the occurrence of monotonous, large, isolated tumor cells of lymphoid appearance, with irregularly shaped nuclei and single or multiple nucleoli. ICC showed diffuse positivity for CD30 and CD4 and negativity for CD8 and ALK.

Histological examination of the excised capsule confirmed the diagnosis.

**Conclusion:** Awareness of this uncommon tumor type related to breast implant is mandatory for the correct handling, cytological diagnosis, immunostaining of peri-implant effusion specimens and proper clinical management of the patient.

## P12-15 | Merkel Cell Carcinoma Metastatic To Pleural Fluid: A Case Report

A. Lozano; S. Ubalde; M. A. Aparicio; M. Cerdán; M. Alberola; S. Ramón y Cajal; C. Dinarès; J. Temprana-Salvador
*Vall Hebron University Hospital, Barcelona, Spain*

**Objectives:** Merkel cell carcinoma (MCC) is a primary cutaneous neoplasm of aggressive biological behavior that is found mainly in the head and neck in elderly people. It usually presents as a localized skin disease, although, in certain cases, there is evidence of regional lymphatic disease or the existence of distant metastasis at the time of initial diagnosis.

**Methods:** We report the case of a 84-year-old man who was diagnosed in 2014 with a 3.5 cm MCC in the right hip with negative surgical margins and negative sentinel node biopsy. Recurrence was observed in 2015 in the left kidney, undergoing systemic treatment. The patient was admitted in august of 2017 with dyspnea secondary to pleural effusion. Thoracocentesis was performed and pleural fluid was extracted for cytological study.

**Results:** Cytology smears showed abundant round and monomorphic cellularity arranged in cohesive sheets, with scarce cytoplasm,

regular nuclear membrane, finely granular chromatin and visible nucleolus. Abundant mitoses were also identified. The differential diagnosis should be made between small cell carcinoma, neuroendocrine tumors, high-grade undifferentiated carcinomas, melanoma and lymphomas. Immunocytochemical study demonstrated positivity for CD56 and CK AE1/AE3 in the tumor cells, confirming the diagnosis of invasion by neuroendocrine carcinoma compatible with known Merkel cell carcinoma. The patient perished in September 2017.

**Conclusions:** Merkel cell carcinoma (MCC) is a rare aggressive neuroendocrine carcinoma of the skin that shows locoregional and distant metastasis. Metastasis of MCC to body cavity effusion is extremely rare; only four cases had been reported so far. Given the fatal prognosis of this tumor comparable to melanoma and rarity of its occurrence in pleural fluid, awareness of this tumor and use of immunohistochemical stains are critical in arriving at the diagnosis. FNA is proven to be a useful method and reliable for the diagnosis of such cases.

## P12-16 | Case Report: Cytological Examination Of Peritoneal Fluid For The Diagnose Of Metastatic Chondrosarcoma

S. Moreno; M. Velásquez; C. Rodriguez; J. Apaza; M. García; S. González; F. Lozano; J. Rodriguez-Costa
*Hospital General Universitario Gregorio Marañón, Madrid, Spain*

**Introduction:** Chondrosarcoma are the second most common malignant bone tumor. While the disease can affect people of any age, unlike most other forms of skeletal system cancer, it is more common among older people than among children and commonly involves the pelvis, the ribs, and the shoulder girdle.

**Methods:** A 59-year-old female patient, with medical history of right rib chondrosarcoma (diagnosed and resected in 1978) with multiples pulmonary recurrences (9 surgical resections from 1982 until 1991). CT scan performed in January 2010, shown multiples tumoral lesions with mass effect at abdominal level, with liver involvement and herniation in previous surgical wound. There were also detected multiple pulmonary tumors, the largest one had 42 mm. In the next CT scan, performed 11 months later, progression was found. Cytoreductive surgery was scheduled at February 2011. As intraoperative finding was a moderated amount of intraperitoneal free fluid, from which samples were sent for cytological examination.

**Results:** Liquid based cytology revealed a moderate cellularity, showing dense-staining chondroid matrix, with cells containing large nuclei with coarsely granular chromatin and nucleoli, suggesting a chondroid nature low-grade neoplasm.

A pelvic cytoreductive surgery was performed, total hysterectomy with bilateral adnexectomy. The histologic examination shown an extense invasive neoplasm, mesenchymal lineage, formed by cells with chondrocytic aspect, elongated or polygonal nuclei, hyperchromatic and moderately pleomorphic, with broad vacuolated cytoplasm, which grow forming solid nests separated by a myxoid stroma, with necrosis images (10%), 3/10HPF mitosis and a cell proliferation index (Ki67) less than 5%; therefore, the diagnosis of Grade 2 Chondrosarcoma was issued, with left ovary and bilateral parametrial involvement and multiple peritoneal implants.

**Conclusions:** Liquid based cytology is a significant and useful tool that allows the diagnose of very complex neoplasm through non-invasive techniques, and also can accurate intraoperative consultation in extended neoplasms.

## P12-17 | Pleural Effusion Infiltration By Multiplpe Mieloma (MM): Case Report And Literature Review

R. Benages; S. González-Moya; J. Martos; A. Lozano; M. Alberola; F. Garcia-Fouz; S. Ramón y Cajal; C. Dinarès
*Vall d'Hebron University Hospital, Barcelona, Spain*

**Objective:** MM is the second most frequent hematological malignant neoplasm. It's a malignant proliferation of plasma cells that mainly affects bone marrow, although extramedullary tissues can also be infiltrated. Pleural effusion can be present in 6% of patients where can be identified the presence of plasma cells in 0.8% of cases. When the atypia is very marked, CD138 helps to establish the plasma cell line.

**Methods:** The case presents itself on a 60 year old man who was attended in our institution for a pulmonary consolidation in the left upper lobe with ipsilateral pleural effusion. His medical history included plasmablastic MM of light Kappa chains. The patient presented a thoracic pain and in both hips that limited his correct movement.

An thoracocentesis was performed obtaining 600 cc of hematic liquid.

**Results:** Two cytologic papanicolaou stained slides were performed, in which it could be observed highly amount of atypical plasmocitoid cells, with eccentric nuclei, dense or vesicular chromatin and basophilic well delimitated cytoplasm.

Extra cytospin slides were performed for CD138 immunocytochemical stain obtaining a diffuse expression on tumoral cells. Finally we made the diagnosis of "Positivity to malignant cells, compatible with infiltration by MM".

**Conclusions:** Pleural effusion affectation by MM it's an uncommon finding. However, it's diagnosis on cytology samples does not suppose problem especially when the history is known. PAAF is a reliable technique to obtain enough material for the realization of smears and also ancillary technics. Not only CD138 but also Kappa and Lambda light chain immunostains are actually of help in diagnosis of MM.

## P12-18 | Unusual Metastatic Sites Of Malignant Pleural Mesothelioma-Could Cytology Be Useful In Diagnosis?

B. Önal[1]; L. Memiş[2]; D. Gürel[3]; N. Yücel[4]; E. Dündar[5]

*[1]Duzce Unıversity, Konuralp campus, Turkey; [2]Gazi University, Ankara, Turkey; [3]Dokuz Eylül Unıversity, İzmir, Turkey; [4]Suat Seren Chest Diseases and Chest Surgery Training and Research Hospital, İzmir, Turkey; [5]Eskisehir Osmangazi University, Eskisehir, Turkey*

**Objectives:** Malignant pleural mesothelioma (MPM) is a rare tumor, but the incidence is increasing and the mortality is high. Usually, metastatic disease is not represented at the time of initial diagnosis. Major sites for metastases are regional lymph nodes, lung, liver, adrenal glands, and kidneys. Extrapleural spread was detected in 87.7% of cases in literature; liver (31.9%), spleen (10.8%), thyroid (6.9%), and the brain (3.0%). In addition to usual sites of for metastases such as regional lymph nodes and bronchus we present epithelioid/biphasic types MPM cases with distant metastases to liver, bone, bone marrow (second case in literature), brain, intraoral cavity, scalp skin, skeletal muscles.

**Methods:** Turkish Mesothelioma Working Group (WG) was founded in 2011 for conducting multisiplinary researches and includes 158 physicians/academicians from 42 university/state hospitals in Turkey. A pulmonolojist (prof. M.M.) is the founder/first coordinator. WG members record all their patients by demographic data (name, address, birthplace, diagnosis/death dates), clinical, imaging, and morphological findings. There are currently 6 member pathologists in the WG (including the authors with affiliation numbers of 1,2,5) and they make a record of also the detailed cyto/histological findings.

**Results:** In addition to the usual sites of for metastatic examples such as regional lymph nodes and bronchus we present and illustrate epitheloid and biphasic types MPM cases (pathologically confirmed) with distant metastases to liver, bone, bone marrow (second case in literature), brain, intraoral cavity, scalp skin, skeletal muscles and, even one case with skeletal muscle, endocardium and subcutaneous tissue dissemination in the same patient (the first published case in the literature).

**Conclusions:** We presented these patients for the interestingness due to unusual and some of which previously undefined diffuse metastasis of malign mesothelioma. We emphasize that unexpected distant metastases can be seen in MPM and occasionally primary diagnosis can be made by even cytopathology of the metastases in addition to the PET-CT.

# P13 GASTROINTESTINAL CYTOLOGY

## P13-1 | An Institutional Experience On Ltrasound Guided Fine Needle Aspiration Cytology Of Gallbladder Lesions

C. Rana[1]; N. Krishnani[2]; N. Kumari[2]

*[1]Department of Pathology, King George's Medical University, Lucknow, UP, India; [2]Department of Pathology, Sanjay Gandhi Institute of Medical Sciences, Lucknow, UP, India*

**Objective:** The data on fine needle aspiration cytology of gall bladder lesions is scare as this procedure in not usually performed for fear of causing biliary peritonitis. The aims of the present study were to evaluate the diagnostic application of ultrasound-guided (US) FNA cytology in the pre-operative diagnosis of neoplastic as well as non-neoplastic lesions of the gallbladder and to review the cytomorphological spectrum of gallbladder lesions encountered along with various diagnostic difficulties that can arise during reporting.

**Methods:** The study was carried out on patients with gallbladder lesions in whom US-guided FNA was performed over a 5-year period. In 130 cases, simultaneous aspirations from other organs were done. No major complications such as haemorrhage, peritonitis, etc. were encountered related to the procedure.

**Results:** The majority were mass lesions whereas in 73 cases (12.2%) only focal or diffuse gallbladder wall thickening was present. Cytological examination of 596 cases revealed malignancy in 462 (77.6%), 26 (4.4%) suspicious of malignancy, 23 (3.8%) inflammatory lesion, 29 negative (4.8%) and 56 cases showed necrosis only or were inadequate for any definite opinion. The lesions diagnosed on FNA cytology included carcinoma (predominantly adenocarcinoma), xanthogranulomatous cholecystitis (XGC), acute suppurative inflammation and tuberculosis. Of 26 with adequate cytology, 24 were accurate with respect to malignant (including one suspicious FNA) vs. benign: one false positive and one false negative both involved xanthogranulomatous change.

**Conclusion:** The present study is the largest series evaluating the role of US-guided FNA in the diagnosis of gallbladder lesions. It is a safe, rapid, reliable, cost-effective and reasonably accurate method for diagnosing gallbladder lesions. FNA should always be attempted in cases with a mass lesion.

## P13-2 | Perigastric Solitary Fibrous Tumor (SFT) Diagnosed On Fine Needle Aspiration. A Diagnostic Challenge In Cytology

M. Policarpio-Nicolas; Z. Mangaru

*Cleveland Clinic, Cleveland, Ohio, USA*

**Objective:** Solitary fibrous tumors (SFTs) are mesenchymal tumors commonly found in the pleural and peritoneal cavities. SFTs of

extrathoracic location are uncommon with half of the cases located in the extremities and rare surgical pathology case reports in the stomach. While histologic diagnosis of SFTs is relatively straightforward, the cytologic diagnosis can be challenging due to its rarity in the perigastric area and its potential mimicry with other perigastric/gastric spindle cell tumor.

**Method:** We report the cytologic features and immunohistochemical stain results of SFT located in the perigastric region.

**Result:** The patient is a 70 y/o woman who presented with a 6.6 cm perigastric mass. An endoscopic ultrasound-guided fine needle aspiration was performed. The smears showed oval to spindle cells with elongated nuclei and scant to moderate cytoplasm arranged singly and in clusters and focally interspersed by ropy collagen. Atypia is minimal. Necrosis and mitotic figures were not present. The cell block showed tightly packed spindle cells with minimal cytoplasm embedded in a collagenous stroma. Immunohistochemical stains showed the tumor cells are positive for CD34, BCL2, STAT6 and negative for CD117, DOG1, CD31, ERG-ENDO, AE1/AE3, S-100, desmin and synaptophysin; confirming the diagnosis of solitary fibrous tumor.

**Conclusion:** While gastric/perigastric solitary fibrous tumors do occur, they are far less common than gastrointestinal stromal tumors, leiomyoma and schwannoma. The diagnosis of perigastric SFT by fine needle aspiration cytology can be challenging due to its uncommon location, scarcity of reports on the typical cytologic findings and lack of characteristic histologic architecture on limited cytology material. Given the difference in prognosis and management of SFT compared to other gastric/perigastric spindle cell tumors, inclusion of SFT in the differential diagnosis and use of immunohistochemical stains especially STAT6 will be extremely useful in arriving at the correct diagnosis.

## P13-3 | Solid-Pseudopapillary Neoplasm With Prominent Atypical Multinucleated Giant Tumor Cells Mimicking Pancreatic Undifferentiated Carcinoma With Osteoclast-Like Giant Cells. A Diagnostic Pitfall In Cytology

M. Policarpio-Nicolas; J. Brainard
*Cleveland Clinic, Cleveland, Ohio, USA*

**Objective:** Solid-pseudopapillary neoplasm (SPN) is a rare tumor of the pancreas often seen in young women associated with a favorable prognosis. Although the classic cytologic features are well-known, to our knowledge, the cytologic findings of SPN with prominent atypical multinucleated giant tumor cells (MNGTCs) has not yet been reported.

**Method:** We report the cytologic features and immunohistochemical stain results of SPN with atypical MNGCTs and review the literature.

**Result:** A 25 y/o male complained of epigastric pain unrelieved by medications. Ultrasound revealed a 3.1 cm mass at the body of the pancreas. EUS-guided FNA showed several multinucleated giant cells with large, bizarre, hyperchromatic, irregular nuclei and scant to moderate faintly vacuolated cytoplasm. Occasional intracytoplasmic and extracellular eosinophilic globules were identified. Other areas showed papillary fronds lined by mononucleated tumor cells admixed with atypical MNGTCs. A preliminary diagnosis of suspicious for malignancy was rendered during the rapid onsite evaluation. The cell block showed papillary fronds lined by large atypical bizarre MNGTCS admixed with mononucleated cells. Immunohistochemical stains showed both the atypical MNGTCs and mononucleated cells are positive for beta-catenin, CD10, vimentin, CD56, variably positive for synpatophysin and negative for AE1/AE3, chromogranin, CDX2, CA19-9, TTF-1, GATA3 and S100. Ki-67 showed low proliferation index.

**Conclusion:** SPN with prominent atypical MNGTCs is a rare with only 2 publications in surgical pathology journal. The patients were older, slightly more frequent in males and located in the head of the pancreas. Both papers showed favorable prognosis despite the presence of atypical MNGTCs. Given the difference in prognosis and management, familiarity with the cytologic findings of this uncommon cytomorphology and use of immunohistochemical stains are extremely useful in differentiating this tumor from pancreatic undifferentiated carcinoma with osteoclast-like giant cells, pleomorphic pancreatic endocrine tumor, metastatic sarcomatoid carcinoma and sarcoma.

## P13-4 | Metastatic Breast Carcinoma With Neuroendocrine Features: A Case Presentation

L. Onuba; L. Ozretic; M. Perez - Machado
*Royal Free Hospital, London, UK*

**Objectives:** The aim of this review is to describe an unusual case of metastatic breast carcinoma with neuroendocrine differentiation in a 71 year old woman. The patient had a known history of left breast carcinoma treated successfully with mastectomy, lymphadenectomy adjuvant chemotherapy, and follow up Tamoxifen. She later presented with skull and peri-pancreatic lesions.

**Method:** The skull lesion was biopsied and diagnosed as a neuroendocrine lesion. Biopsy and cytology samples were taken of peri-pancreatic lesion at Royal Free Hospital. FNA pancreas showed atypical cells consistent with malignancy. Cell block and immunohistochemistry were subsequently performed.

**Result:** The atypical cells showed positive staining for AE1/3, GATA 3, chromogranin and synaptophysin. These findings correlated with the peri-pancreatic and scalp biopsies, which also showed ER positivity.

**Conclusion:** A diagnosis of metastatic breast adenocarcinoma with neuroendocrine differentiation was made. Neuroendocrine differentiation can be observed in poorly differentiated breast adenocarcinomas. Metastatic breast carcinoma should always be suspected for

any metastasis with neuroendocrine features in a patient with a history of breast cancer.

## P13-5 | Classification Of Pancreaticobiliary Cytology By Fine-Needle Aspiration Cytology Guided By Endoscopic Ultrasound According To The System Of The Papanicolau Society Of Cytopathology At The General University Hospital Of Albacete

M. D. Berenguer Romero; L. Viguera Garrido; G. Fliquete Serrano; M. N. Martínez López; R. Vera Berón; I. R. Sarabia Ochoa; S. H. Nam-Cha; M. Simón Matías; R. D. García Ángel
*General University Hospital of Albacete, Albacete, Spain*

**Objective:** To classify the pancreaticobiliary cytology by fine-needle aspiration cytology guided by endoscopic ultrasound (FNAC-EUS) according to the system of the Papanicolau Society of Cytopathology in the General University Hospital of Albacete.

**Methods:** Pancreaticobiliary FNAC-EUS diagnoses from 2008 to 2017 were reviewed and reclassified into six categories according to the system of the Papanicolau Cytopathology Society, proposed in 2016. Category 1 non-diagnostic, 2 negative for malignancy, 3 atypical, 4A neoplastic benign, 4B neoplastic others, 5 suspect for malignancy and 6 positive or malignant.

**Results:** During this period 530 FNAC-EUS were performed, all of them with rapid on-site evaluation (ROSE). 39 (7.36%) cases belonged to category 1 and 123 (23.21%) to category 2. 38 (7.17%) cases belonged to category 3; 26 (4.91%) to category 4A of which 17 (65.38%) belonged to unclassifiable cystic lesions and 9 (34.62%) serous cystadenomas. 98 (18.49%) cases were classified as category 4B, 42 (42.86%) represented mucinous cystic neoplasms and 31 (31.63%) well-differentiated neuroendocrine tumors. 14 (2.64%) cases belonged to category 5 and 192 (36.23%) to category 6 of which 186 (96.88%) were diagnosed as carcinomas.

**Conclusions:** This classification system aims to standarize the terminology in the diagnoses, being adopted in our hospital since 2016. Previously, the studies were reported as benign or malignant findings and no samples for biochemical study were taken. In our study, 17 non-classifiable cystic lesions were found, none of them with biochemical data, and could not be classified according to their biological potential. With the use of this system it has been possible to divide the benign and cystic lesions into categories according to their malignancy potential and in relation to the biochemical findings, taken routinely during the procedure. Thus, communication between physicians in the Pancreaticobiliary Tumor Committee is favored and the management of pancreatic cystic lesions with malignant potential improves.

## P13-6 | Solid Pseudopapillary Tumor: A Case Report And Review Of The Literature

J. P. Ball; M. J. C. Porras; M. A. Gonzalez; M. R. G. de la Bárcena; E. G. Toro; C. E. Iturbe; Md. M. Pascual; I. G. Higuera; P. de Llano Varela
*Hospital Universitario de Burgos (HUBU), Burgos, Spain*

**Introduction:** Solid pseudopapillary neoplasms (SPN) of the pancreas are rare indolent but malignant tumours that constitute less than 2% of all exocrine pancreatic tumours.

Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) has an important role in providing an accurate preoperative diagnosis of pancreatic lesions. EUS-FNA can differentiate SPN from other pancreatic neoplasms of similar radiological and cytological appearance, such as pancreatic neuroendocrine neoplasm, acinar cell carcinoma, pancreatoblastoma and pancreatic mucinous cystic neoplasm.

**Objectives:** Our aim is to present an in house case report and to review the SPN literature.

**Material and methods:** The case of a 30-years-old female with a long history of epigastralgy as a sole symptom is presented. A lesion at pancreas body obtained from EUS leads the differential diagnosis between pseudocyst and neoplasm with necrotic regions. Specimens from EUS-FNA are obtained which is processed by liquid citology. Several immunohistochemical stains are applied over the sample.

**Results:** Smears were hypercellular composed of small, uniform cells in cohesive, often branching, and papillary cell clusters. As well, small clusters and single neoplastic cells in the background were microscopically observed. The nuclei were round or oval, eccentric with finely granular chromatin. Immunostains yielded vimentin and beta-catenin positivity. This gives rise to a diagnosis of SPN, which was confirmed by the analysis of the surgical resection.

**Conclusions:** Although these tumours can be suspected on the basis of clinical and radiographic findings, the diagnosis must be made in tissue, with specimens obtained through EUS-FNA or surgical resection.

## P13-7 | On Site Cytology Of Pancreas EUS FNA – The Results Of 11 Years Of Cooperation

B. Šnajdrová[1]; P. Hurník[1,2,3]; V. Židlík[1,3]; D. Žiak[1,3]; L. Kučerová[1]; A. Jalůvková[1]; J. Šustíková[1,2]; O. Urban[4,5]; P. Fojtík[4]; V. Zoundjiekpon[4]; M. Uvírová[1]; J. Dvořáčková[1,2,3]
*[1]CGB laboratory – Ostrava-Vítkovice, Czech Republic; [2]Faculty of Medicine, University of Ostrava, Czech Republic; [3]Faculty Hospital Ostrava, Czech Republic; [4]AGEL Research and Training Institude, Vítkovice Hospital – Ostrava, Czech Republic; [5]Faculty Hospital Olomouc – Olomouc, Czech Republic*

**Objective:** Quick and accurate diagnostics of pancreatic lesions is essential for therapeutic management. In many cases the physician is not able to recognize malignant potential of lesion by using only

noninvasive methods. On site EUS FNA is for its accuracy and speed method of choice for diagnostics of gastrointestinal tract's lesions.

Our aim is to survey diagnostic sensitivity and specificity of on site cytologic diagnostics and classical EUS FNA and advanteges of on site cytology.

**Methods:** For retrospective overview it was chosen 1,224 of EUS FNA pancreatic cytology of years 2007–2017. Whole file was divided into two groups. Group A includes patients, whose cytologic samples were prepared only by clinician. Group B includes patients, whose cytologic samples and overall evaluation were provided by cytopathologists on site.

Most of these samples were stained by MGG QUICK STAIN method, at least one sample from every punction was stained by Periodic Acid Schiff method.

**Results:** Groups were composed of 668 men and 556 women. We made 957 (78.18%) on site cytologies, 216 (17.66%) cytologies without on site and 51 (4.16%) samples weren't diagnostic. Quality of the method was evaluated according to sensitivity, specificity and accuracy. Diagnostic method on site had sensitivity 96.06% and specificity 95.75%. Diagnostic method without on site had sensitivity 89.25% and specificity 97.59%. Evaluation of accuracy also confirmed statistical significance in favor of on site diagnostics.

**Conclusion:** On site EUS FNA cytology is good tool for diagnostics of solid and cystic pancreatic lesions. Presence of a pathologist on site allows close cooperation with clinician, by that is improved quality and quantity of samples and accuracy of diagnostics. It also reduces need to repeat sampling and that means less complications for patient.

## P13-8 | Cytologic Diagnosis Of Adenocarcinoma Of Oesophagogastric Junction In Oesophagic Brushing Specimen. A Case Report

C. Psachoulia[1]; P. Mposgana[1]; P. Zili[2]; M. Kardari[1]; C. Chondrogianni[1]; E. Kourea[1]

*[1]University Hospital of Patras, Patras, Greece; [2]General Hospital of Corfu, Corfu, Greece*

**Objectives:** Adenocarcinomas of the oesophagogastric junction are highly aggressive tumors with worse prognosis and according to the staging system adopted by the American Joint Committee on Cancer (AJCC) are grouped as a subsite of esophageal cancer. A case of adenocarcinoma of oesophagogastric junction diagnosed in oesophagic brushing specimen is presented.

**Methods:** A 28 year old man was admitted to the hospital mainly complaining for progressive difficulty and pain during swallowing of 2 months duration. Pulmonary and abdomminal CT revealed the presence of multiple enlarged lymph nodes in the mediastinum and multiple hepatic nodules respectively. On oeosophageal endoscopy a semilunar, ulcerative lesion on the distal oesophagus and at the oesophagogastric junction was detected. A brushing of the edges and the floor of the lesion was performed along with a biopsy. The cytologic brushing material was collected in a liquid based specimen (ThinPrep) and the smears were stained with the Papanicolaou stain.

**Results:** The cytologic smears were cellular and showed the presence of neoplastic cells, mainly in groups, with pleomorphic nuclei, irregular nuclear membrane, increased N/C ratio, coarse chromatin and prominent nuclei. In addition, groups of dysplastic glandular cells were noticed. The cytological diagnosis based on the cellular morphology was consistent with adenocarcinoma. The histopathologic report confirmed the cytologic diagnosis.

**Conclusions:** We wish to emphasize the role of oesophaghic brushing cytology, contributing to the diagnosis and treatment of primary adenocarcinoma of oesophagogastric junction.

## P13-9 | Diagnostic Utility Of Tissue Blocks Versus Short Storage Cell Medium In Abdominal Endoscopic Ultrasound Guided Fine Needle Aspirates

H. Gutnik; M. Strojan Fležar; I. Srebotnik Kirbiš

*Faculty of Medicine University of Ljubljana, Ljubljana, Slovenia*

**Objectives:** Endoscopic ultrasound guided fine needle aspiration (EUS FNA) frequently yields scanty samples. Direct smears are prepared for rapid on site evaluation and subsequent diagnostic evaluation and the remaining sample is rinsed in short storage cell medium. Additionally, any visible tissue fragments or blood clots are processed as tissue blocks in order to obtain a better morphological evaluation of lesions and perform broader panel of immunocytochemical reactions.

**Methods:** In the 6-years period we examined 318 endoscopic ultrasound guided fine needle aspirates and in 106 (33%) samples, tissue blocks were made. Seventy-nine (74.5%) lesions originated from pancreas, 11 (10.5%) from lymph nodes, 16 (15%) from the wall of gastrointestinal organs or adjacent structures. Tissue blocks were compared to short storage cell medium regarding the content of diagnostic cells and suitability to perform immunocytochemical reactions.

**Results:** In 40 (38%) samples, tissue block and short storage cell medium contained diagnostic cells; in 35 (33%) samples only short storage cell medium was diagnostic; 14 (13%) samples had diagnostic tissue block, but not short storage cell medium; in 17 (16%) samples neither tissue block nor short storage cell medium were diagnostic, but the diagnosis was made from direct smears of EUS FNA. In 23 (22%) of 106 samples immunocytochemical reactions were performed, 9 on tissue blocks, 9 on short storage cell medium and in 5 cases on both parts of EUS FNA sample.

**Conclusions:** In EUS FNA, tissue blocks are useful additional tool to assess cell morphology, but are not superior to short storage cell medium regarding the yield of diagnostic cells. Additional immunocytochemical stains are feasible on both type of preparations, the choice of preparation for ancillary studies depends on the number and morphology of cells.

## P13-10 | Fine-Needle Aspiration Of Pancreatic Lesions Using Ecoendoscopy: Our Experience, Reclassification And Cytohistologic Correlation 2014-2017

C. González; P. Pontes; O. Gibert; F. Garcia; L. Luizaga; F. Perez; R. Albero; C. Loras; C. Báez; X. Tarroch
*Hospital Universitari Mútua Terrassa*

**Objectives:** Fine-needle aspiration (FNA) guided by ecoendoscopic ultrasound (EUS-FNA) is an increasing technique used for the diagnosis of pancreatic lesions. The objective of this study was to review and reclassify the cytological diagnosis, according to the 2014 Papanicolau Society of Cytopathology (PSC) classification, and correlate them with histopathology.

**Methods:** We reviewed 152 cases of EUS-FNA of pancreatic lesions, from 2014 to 2017. The cytological diagnoses were reclassified according to PSC, and correlated with the clinical-radiological, biochemical and histopathologic findings.

**Results:** There were 91 men and 61 women, from 16 to 89 years old (average of 64 years). The cases were distributed according to the PSC classification, I: 20 (13.2%), II: 36 (23.7%), III: 5 (3.3%), IVa: 1 (0.7%), IVb: 18 (11.9%), V: 6 (3.9%) and VI: 66 (43.4%). Seven cases previously diagnosed as negative for malignant cells, were reclassified as follows: 4 in category I, and 3 in category IVb. One of these IVb cases had a histological diagnosis of serous cystadenoma. In 55 cases we could finally make clinical and/or histological correlation: 23 cases had surgical specimen and 32 died because of their tumor. Among these 55 cases, we had 48 categorized as true cytological positive with histological confirmation for malignancy or exitus; 3 as true negative; 3 as false positive and 1 as false negative.

Sensitivity was of 97.9%, specificity was of 50%, positive predictive value was of 94.1% and negative predictive value was of 75%.

**Conclusions:** The EUS-FNA is a good method of diagnosis and, in many cases, is the only available morphological diagnosis of these lesions. The cytological correlation with radiology, biochemistry and molecular parameters is important. The new classification proposed by the Papanicolaou Society of Cytopathology is useful and allows to categorize more accurately these lesions.

## P13-11 | Utility Of Endoscopic Ultrasound-Guided Fine Needle Aspiration In Diagnosis And Grading Of Neuroendocrine Pancreatic Lesions

M. Bauza[1]; V. Martínez i Cózar[1]; A. Herrera Rabadan[1]; L. Scavino Pinto[1]; M. D. Comes García; H. Mauricio Aviñó; J. Pérez Rojas[1]; M. J. Artés Martínez[1]; M. Prieto Rodríguez[1]; F. J. Vera-Sempere[1,2]
*[1]Hospital Universitari i Politècnic La Fe, Valencia, España; [2]Universidad de Valencia, Valencia, España*

**Objectives:** Determine the utility of pancreatic endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) for the diagnosis and grading of neuroendocrine lesions of the pancreas in correlation with histopathological findings.

**Methods:** We searched the pancreatic EUS-FNA from 2004 to 2018, and selected the neuroendocrine lesions. Morphological and inmunohistochemical results (chromogranin, synaptophysin and/or Ki67) as well as demographic data of patients were collected.

To perform the grading, we counted the number of mitosis in 10 high-power fields (HPF) and the proliferation index (PI) measured with Ki67: less than 2 mitoses and/or less than 2% PI were graduated as well differentiated neuroendocrine tumor (WD-NET) G1. If 2–20 mitoses and/or 2%–20% of PI were graduated as WD-NET G2; more than 20 mitoses and/or more than 20% of PI were classified as WD-NET G3/neuroendocrine carcinoma (NEC). Finally the correlation was made between cytology and biopsy in case of having it.

**Results:** We found 414 cases of pancreatic EUS-FNA of which 43 (10.38%) corresponded to neuroendocrine lesions according to cytology diagnosis. There was a slight predominance of the female sex (55.8%) and the average age was 55.3 years ($53.3 \pm 16.3$)

Immunohistochemical stains were not performed only in 1 case (lack of material). In 42 cases, immunoreactivity was demonstrated for chromogranin and/or synaptophysin.

Regarding the grading, the majority corresponded to WD-NET G1 with a total of 37 cases (86%), 2 cases of WD-NET G2 (4.65%) and 4 cases of WD-NET G3/NEC (9.3%).

Histopathological examination was performed only in 18 patients (41.8%) and we found 100% correlation in terms of diagnosis, gradation and immunohistochemical results.

**Conclusions:** EUS-FNA is a useful, mildly-invasive technique with a high diagnostic power in neuroendocrine pancreatic tumors and carcinomas, which allows correct diagnosis and grading approximation, avoiding diagnostic biopsy in many cases and showing high correlation when the biopsy was performed.

## P13-12 | Role Of Anal Exfoliative Cytology In The Screening Of Anal Displasic Lesions

V. Martínez i Cózar[1]; M. Bauza[1]; L. Scavino Pinto[1]; A. Herrera Rabadán[1]; L. Galeano Paniagua[1]; I. Zapata Rivas[1]; J. Haba Moya[1]; F. J. Vera-Sempere[1,2]; M. J. Artés Martínez[1]; M. Prieto Rodríguez[1]

*[1]Hospital Universitari i Politècnic La Fe, València, España; [2]Universitat de València, València, España*

**Objectives:** To determine the value of anal exfoliative cytology in the screening of dysplastic and pre neoplastic injuries in a population with high risk of developing anal carcinoma.

**Methods:** Currently, our hospital holds a screening program of patients with high risk of developing anal carcinoma; male homosexuals HIV positive and negative, women with genital warts, HPV infection with cervical, anal or vaginal dysplasia and every HIV positive patient. We have collected all the cytologic smears between 2016 and 2017 in our hospitals population area, dividing in groups according to presence or absence of anal dysplasia, its grade, HPV strain, subdividing between high to low risk strain. Two methods of PCR are used in our hospital, the Cobax method that detects high risk strains: 16, 18 and "others" (and the Anyplex II that detects 19 high risk trans and 9 low risk strains.

**Results:** We studied 147 smears of which 136 belonged to men (92.5%) and 11 to women (7.5%). 51 of which showed dysplasia (34.7%), 43% corresponding to AIN I and 8 to AIN II-III. Out of the 147 smears, 6 (4%) were positive for low risk HPV and 77 (52.3%) for high risk HPV; in the latter, the most frequently detected strains were the "Others" group (46.75%), then 16 (10%), and lastly strain 18 (3.2%). In the cases biopsied with high-grade dysplasia (13 cases), the correlation was 100%. In cases without dysplasia, the most frequent strains were the "Others" group.

**Conclusions:** Exfoliative cytology is a very reliable method for the clinical follow-up and diagnosis of anal preneoplastic lesions in a population at risk that prevents the systematic performance of biopsies. Through molecular biology (PCR) techniques, the HPV strains associated with carcinogenesis can be determined as well, the existence or not of co-infection, and the realization of broad population studies.

## P13-13 | Incidental Finding Of A Solid Papillary Neoplasm Of The Pancreas During Bariatric Surgery

A. Hinsch; A. M. Luebke

*University Medical Center Hamburg-Eppendorf, Hamburg, Germany*

**Background:** Solid papillary neoplasm (SPN) of the pancreas is a rare pancreatic malignancy, accounting for 0.9–2.7% of all pancreatic neoplasms and most frequently found in the body or tail (59.3%). The tumor is most prevalent in young female adults and adolescents (mean age 28.5 years). Although the malignant potential of SPN is low, they can grow locally aggressive and metastasize. Therefore, surgical resection is the treatment of choice (1).

**Case Report:** In the course of an endoscopic sleeve gastrectomy of a 41-year-old woman, the surgeon noticed an enlargement of the pancreas. The procedure was canceled. On endoscopic ultrasound, a partly cystic, partly solid lesion (30x30 mm) was detected and fine needle aspiration (FNA) was performed. Six slides were received and Papanicolaou stained.

On low power magnification, multiple fragments of branching pseudopapillary structures reminiscent of "Chinese characters" could be seen. On higher magnification a true delicate vascular core with endothelial lining was present, lined by one or more layers of loosely cohesive epithelioid cells.

On high power magnification, the monotonous tumor cells had round to oval nuclei with a finely granular chromatin, detectable small nucleoli, and fine nuclear grooves. The cytoplasm appeared pale eosinophilic. In some areas, the cells were arranged in discohesive layers or forming pseudorosettes. Ancillary immunocytochemistry revealed aberrant strong nuclear staining for ß-catenin, which confirmed the diagnosis of a solid papillary neoplasm of the pancreas (2).

Due to severe obesity of the patient, endoscopic sleeve gastrectomy was performed. An open pancreatectomy would have been too risky at this time. The therapeutic regimen is to reevaluate the patient for pancreatectomy after significant weight loss.

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## P13-14 | Endoscopic Ultrasound-Guided Fine Needle Aspiration (EUS-FNA) Cytology In Gastric Spindle Cell Neoplasms. A 5 Years Review

J. L. S. Trenado; F. R. Calatayud; P. M. Pavon; I. M. De Lara Simon; C. R. Rodriguez; V. H. Montoro; L. G. Lopez; F. M. Davila; M. D. Portela; R. L. Perez

*Hospital General Universitario De Ciudad Real*

**Introduction:** Gastrointestinal estroma tumors (gists), schwannomas and leiomyomas are the most frequent type of gastric spindle cell neoplasms (scns) included in the subepithelial gastric lesions spectrum. the aim of the present study is to evaluate the accuracy of EUS-FNA cytology in the diagnosis of these lesions.

**Objective:** We examined all the gastric eus-fna cytologies performed in our institution between 2012 and 2017. We found 8 cases of gastric gists. the mean age of the patients was 62 years and 62.5% were males. Gastric fundus was the most predominant site of tumors. Cytologically all the neoplasms were composed of spindle cells single or arranged in cohesive groups with no other cellular types. the spindle cells had scant, lightly eosinophilic cytoplasm and elongated to oval plump nuclei. immunostaining was performed in 5 of 8 cases with cd117, desmin, sma, s100, cd34 and cytokeratins. in 4 cases the samples was scant and we could not achieve good immunohistochemical results. Cd117 was positive in 4 of 5 cases of gists.

We verified the cytological diagnosis by examining the surgical specimen in 4 cases. The mean size of the tumors was 6.1 cm.

**Conclusion:** Eus-fna cytology is a very accurate method for the diagnosis of gastric sncs and is more useful than endoscopic biopsy in these tumors because it can penetrate deeper in the submucosa. Thus, we think that eus-fna has a great value as presurgical diagnostic procedure in gastric subepithelial lesions and ensure an appropiate therapy for these patients.

## P13-15 | Our Experience In Pancreatic Neuroendocrine Tumors By Fine Needle Aspiration

K. Garcia; B. Aguiar; S. Razquin; E. Almudevar; D. Requena; J. Elizalde

*Complejo Hospitalario de Navarra, Pamplona, Navarra, Spain*

**Objectives:** Pancreatic neuroendocrine tumors (PanNETs) are an uncommon pathology that accounts for 2% of all pancreatic neoplasms and its behaviour is variable. Endoscopic ultrasound-guided fine needle aspiration (EUS - FNA) is often employed as a diagnostic test. PanNETs are classified according to tumor mitotic count or Ki-67 labelling index in biopsies. The Ki-67 score in EUS - FNA is an alternative approach for establishing the pre-surgical grade. It has been compared the values of Ki-67 obtained by EUS - FNA and those obtained by surgery.

**Methods:** Researching in our files we found sixteen PanNETs diagnosed by EUS - FNA in the last three years within a total of 142 EUS - FNA of pancreas. The assessment of Ki-67 was manual.

**Results:** Sixteen patients (male/female ratio = 1) with a median age of 64 years (44–80) entered in the study. Most of them were grade 1 or 2 of PanNETs. Eight patients (50%) underwent pancreatectomy. There was a concordance of 75% between preoperative and postoperative Ki-67 evaluation. The samples contained discohesive cells that formed rosettes; eccentric, round nuclei; salt and pepper chromatin pattern, scant cytoplasm and some bare nuclei.

**Conclusions:** Ki-67 is a reliable marker for neuroendocrine neoplasms. The values were similar, both by histology and by EUS - FNA.

## P13-16 | Has Diagnostic Accuracy Of Pancreatic Fine-Needle Aspiration (FNA) Cytology Improved Over A Four-Year Period And Does The Retrospective Assignment Of The Papanicolaou Society Of Cytopathology Terminology Enable Improved Concordance With Corresponding Histology? A UK Teaching Hospital's Experience

A. V. Simonovic; M. Perez-Machado; M. Rathbone; K. Weerasinghe

*The Royal Free Hospital NHS Foundation Trust, London, UK*

**Objectives:** To apply this new classification for pancreaticobiliary cytology to a set of previously diagnosed endoscopic ultrasound (EUS)-guided fine-needle aspiration (EUS-FNA) samples. To then correlate these results with those from the corresponding available surgical specimens and, to assess diagnostic accuracy over a four year period.

**Methods:** All pancreatic cytology cases were retrospectively collected over a two year period (1st December 2015 to 1st December 2017) and were assigned the proposed terminology. Any corresponding histology was reviewed and assessed for concordance. The specimens from these two years were compared to those from the previous two years for cytological diagnostic accuracy.

**Results:** Two hundred and thirty seven pancreatic cytology EUS-FNA specimens were collected over the last two year period. Using the new terminology, some of the specimens were reclassified accordingly. Of the 109 cases with corresponding histology, 36 were excluded due to inadequacy. Of the remaining 73 cases, 13 cases showed discordance, 11 of which had malignant histology. The positive predictive value for solid lesions was >90%. When compared with data from the previous two years, cytological diagnostic accuracy has improved (82% compared to 77%).

**Conclusions:** In our centre, our extended retrospective analysis of a previous two year audit has improved the statistical accuracy of our data. Over the 4 years, the false negative rate for pancreatic EUS-FNA has remained constant at 22% but a fall in the false positive rate from 24% to 8% has improved the specificity from 77% to 92%. The sensitivity has remained constant, close to 78%. Our study agrees with other similar studies in that, in conjunction with radiology, biochemistry and molecular testing, pancreatic EUS-FNA cytology with Papanicolaou terminology would improve categorisation of pancreatic EUS-FNA, thus unifying clinician interpretation and potentially improving patient management.

## P13-17 | Evaluation Of Pancreatic Lesions By Fine Needle Aspiration Guided By Ecoendoscopy

L. M. Collaco[1,2]; V. H. Zangarini[1]; E. Bonin[3]

[1]Faculdade Evangélica do Paraná; [2]Centro de Patologia de Curitiba; [3]Hospital Nossa Senhora das Graças, Curitiba, Brazil

**Introduction:** Fine needle aspiration (FNA) is essential for the diagnosis of tumor masses. This technique is widely used and in some cases is indispensable for staging, prognosis and appropriate treatment. FNA guided by echoendoscopy (FNAB-EE), although recent, already demonstrates its importance in clinical diagnosis. It can guarantee the surgeon greater safety in the preoperative planning, reducing the chances of complications for the patient.

**Objective:** To analyze the performance of FNAB-EE in pancreatic lesions through the epidemiological indexes related to fine needle aspiration guided by echoendoscopy in pancreatic tumor masses.

**Methods:** This was a cross-sectional retrospective study, in which 56 PAAF-EE were evaluated between January 2011 and August 2016, from the electronic archives of the Pathology Center of Curitiba-PR. In each case, through the electronic records, age, sex, location, size, classification of Papanicolaou Society of Cytopathology (PSC), cytological diagnosis, biopsy and histological diagnosis were recorded.

**Results:** Of the results obtained, 60.71% were women, 66.1% were head injuries of the pancreas and predominantly solid. By PSC, 41.7% were classified as VI. Of the epidemiological indices we obtained: sensitivity (93.54%), specificity (100%), positive predictive value (100%), negative predictive value (77.77%) and accuracy (94.73%).

**Conclusion:** In the studied population, female patients predominated, head lesions of the pancreas being the most frequent ones of the solid type. By the PSC classification, the most recurrent diagnosis was category VI. In correlation with biopsy, the most frequent diagnosis was adenocarcinoma. The present sample had sensitivity of 93.54%, specificity of 100%, positive predictive value of 100%, negative predictive value of 77.77% and accuracy of the exam in 94.73%.

## P13-18 | Pancreatic Metastases: The Role Of Endoscopic Ultrasound-Guided Fine Needle Aspiration

M. D. C. Gomez-Mateo; M. J. Silva-Carmona; M. Rezola-Bagineta; J. Comba-Miranda; L. Bujanda-Fernandez-de-Pierola

*Hospital Universitario Donostia*

**Objectives:** Primary pancreatic neoplasms are much more frequent than metastatic lesions. However, they should be suspected in patients with prior history of malignancy. The use of endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) has improved the diagnosis of pancreatic tumours and the combined use of cell blocks and immunostains could be usefull to differentiate primary lesions from metastatic origin.

**Methods:** All EUS-FNA procedures performed in Hospital Universitario Donostia from 2007 to january 2018 were reviewed. Only pancreatic and peripancreatic lesions were included. Samples obtained from mediastinal lesions or other organs were excluded.

**Results:** A total of 219 EUS-FNAs were performed during this period. 101 samples (46%) were positive or suspicious for neoplasm. A total of 6 cases were diagnosed of metastatic neoplasms (5.9% of the positive cytologies). 2 were females and 8 were males. Median age was 66 years. The origin of the primary tumour were kidney (n = 2, clear cell carcinoma), lung (n = 1, small-cell carcinoma), skin (n = 2, melanoma) and breast (n = 1, ductal carcinoma). Cell block was available in 1 case and immunostains were performed in all cases.

**Conclusions:** EUS-FNA is the gold standard to diagnose pancreatic lesions. Differentiate primary neoplasms from metastates could be challenging only based on cytomorphology. Furthermore, in patients with previous oncologic history, additional techniques should be performed in order to confirm or ruled out the possibility of metastatic origin. The correct diagnosis of metastatic disease to the pancreas allows clinicians to manage the patient more accurately.

## P13-19 | Esophageal Schwannoma: Cytological Diagnosis About A Case

M. García; C. Ferrara; S. González; M. Basbus; J. Rodríguez Costa

*Hospital General Universitario Gregorio Marañón, Madrid, Spain*

**Introduction:** Schwannoma at esophageal level is a rare entity. It develops from Schwann cells from local peripheral nerves and it is characterized by spindle cells and Verocay bodies formation. Most of them are benign but there are reports of malignant cases with ganglionar metastasis. Elective treatment is surgery enucleation if they are small and complete resection in bigger ones.

**Materials:** 40-year-old patient with a long lasting epigastralgia and pyrosis history. Gastroscopy revealed a non-stenosing submucosal tumour located at 22 cm from the incisor teeth. Suspecting a mesenchimal tumor, an endoscopic ultrasound-guided fine needle aspiration (FNA) of the tumour was made. In view of the results, the elective treatment was surgery.

**Results:** The cytological smears obtained by FNA and stained with Diff Quick, showed groups of spindle cells arranged forming nuclear palisade suggestive of matching Verocay bodies. The inmunocytochemical (ICQ) techniques made on the tissue block showed positivity to Actin SM and negativity to CD34, CD117 and S100 exhausting the available material. The diagnosis based in additional techniques was compatible with Leiomyoma.

After surgery resection, we received in an intraoperative way an esophageal segment which showed a nodular, circumscribed, non-encapsulated, whitish nodule of 2.8 × 2.6 cm. Both in frozen sections and paraffin embedded section, the tumour corresponds which a spindle

cell proliferation where S100 was positive and the rest of the inmunohistochemistry markers were negative (CD34, Actin SM and CD117). Finally, it was diagnosed as Schwannoma.

**Conclusions:** FNA from esophagic and paraesophagic nodules requires a wide spectrum of differential diagnosis. Morphology with ICQ support can be enough to give a certain diagnosis by themselves. The scanty material can be an added problem like in our case but, in general, we can conclude it is very useful to make an accurate diagnosis.

## P13-20 | Gastrointestinal Stromal Tumor (GIST) Diagnosis By Fine Needle Aspiration Cytology (FNAC) At La Paz University Hospital And La Princesa University Hospital

D. Roldán[1]; A. M. Rodríguez[1]; P. López Ferrer[1]; P. González-Peramato[1]; M. Mendiola[1]; A. Peláez[1]; J. A. Jiménez Heffernan[2]; B. Vicandi[1]

*[1]La Paz University Hospital, Madrid, Spain; [2]La Princesa University Hospital, Madrid, Spain*

**Objectives:** Gastrointestinal stromal tumors (GIST) represent less than 1% of tumors of the gastrointestinal tract (GIT) but is the most common primary nonepitelial neoplasm and it has its origin at intersticials cells of Cajal. We reviewed GIST cases diagnosed by FNAC and the utility of this technique in the diagnostic process.

**Methods:** We reviewed our databes and retrieved GIST cases diagnosed by FNAC in a five years period at La Paz University Hospital and La Princesa University Hospital and perfomed a descriptive analysis.

**Results:** We found 17 cases of GIST diagnosis by FNAC in both centers. The specimens were obtained by ultrasound and tomography-guided FNA and EUS-FNA. The most common sampled specimen was the stomach followed closely by hepatic metastases. The predominant morphology was spindled. Inmunocytochemistry was performed in all cases (ej: CKIT, CD34, DOG 1) and molecular analysis (CKIT and PDGFRA) in 12 cases. 11 cases were followed by a biopsy or surgical specimen which confirmed the diagnosis.

**Conclusions:** FNAC is a useful technique in the diagnosis of GIST. The cytology specimens provide a definitive and complete diagnosis that could avoid more aggressive diagnostic procedures. The aspirative material is suitable for inmunocytochemistry techniques and molecular analyses (CKIT and PDGFRA) that can help to confirm the diagnosis and optimize patient treatment.

## P13-21 | Endoscopic Ultrasound Guided Fine Needle Aspiration In Pancreatic Lesions: A Four-Year Retrospective Study With Cytohistological Correlation

G. G. Yange Zambrano; J. Martín López; J. B. García Reyero; J. Martínez-Echevarría Gil-Delgado; M. Martino González; M. A. Revuelta Montoya; M. L. Cagigal Cobo

*Hospital Universitario Marqués de Valdecilla, Santander, Spain*

**Objective:** Endoscopic Ultrasound-guided Fine Needle Aspiration Cytology (EUS-FNAC) is the most common procedure to obtain cytological specimen of pancreatic lesions. The Papanicolau Society of Cytology (PSC) provides a standarized nomenclature in the field of Pancreatobiliar Cytology. Rapid-On-Site-Evaluation (ROSE) method has the potential to check the cellular sample and improve the adequacy rates of FNA cytology.

**Method:** A retrospective study was performed on the pancreatic lesions initially diagnosed by EUS-FNAC between 2014 and 2017 in Department of Pathology, Hospital Universitario Marqués de Valdecilla. EUS-FNAC was performed with ROSE and different needles (22G procore and 19G procore). Cytologic diagnoses were categorized according the PSC Guidelines and were correlated with the clinical data and the histological diagnoses in the cases with surgical treatment.

**Results:** In our series, 291 patients underwent EUS-FNA for suspected pancreatic lesion. We standarized the diagnoses according the PSC guidelines (Category I: 14%, II: 43%, III: 2%, IV: 8%, V: 5% y VI: 30%) and evaluated the impact of the different needles used and the cell blocks obtained.

**Conclusion:** In our study, EUS-FNAC gives a valuable contribution in the diagnoses of all kind of pancreatic masses (benign diseases, primary local carcinomas, cystic lesions or metastases). Using 19G procore and ROSE method we obtained good samples and observed a good correlation between the cytological and histological diagnoses.

## P13-22 | The Value Of EUS-FNAC (Endoscopic Ultrasound Fine Needle Aspiration Cytology) And Articular Fluid Cytology In The Aproach Of A Patient With Ppp Syndrome (Pancreatitis/ Pancreatic Tumor, Panniculitis, Polyarthritis). Case Report

M. C. Castillo Torres; P. Martínez Onsurbe; I. Medina Exposito; M. D. Velez Velazquez; C. Diez Corral

*Hospital Universitario Príncipe de Asturias, Alcalá de Henares, Madrid, Spain*

**Introduction:** Pancreatric paniculitis is a rare entity occurring in patients with pancreatic disorders or pancreatic tumors. When it is associated with polyarthritis is known as PPP syndrome (panniculitis, polyarthritis and pancreatitis/pancreatic tumor). Skin manifestations may precede the diagnosis and the knowledge of this association may lead to a prompt diagnosis and management of a malignant pancreatic tumor.

**Case report:** A 50 year old woman presented with multiple subcutaneous, painful nodules in the anterior and posterior surfaces of the lower extremities. A biopsy of one of the nodules was made and presented a pancreatic paniculitis. The patient follow up showed an elevated serum lipase (>24,000), and a 3.5 cm mass of the pancreatic uncinate process with liver metastasis on CT and MRI. She underwent a EUS-FNA of the pancreatic mass with a 22 G needle. On site microscopic evaluation demostrated malignant cells in one pass. The smears revealed a moderate cellularity with loosely cohesive tissue fragments and acinar tissue fragments, with fibrovascular strands and dispersed single cells. The nuclei were round and uniform with prominent nucleoli. The cytoplasm were dense and finely granular. The background were granular. The neoplastic cells express AE1/AE3, CK18 and trypsin. A pancreatic acinar cell carcinoma was diagnosed. The patient complained of swelling of her lower legs. The articular fluid was aspirated from the left ankle, which was creamy, with an elevated lipase (7,060 U/l) and showed fat necrosis on the smears. The patient was treated with chemotherapy.

**Discussion:** This case illustrates that patients with pancreatic paniculitis and high lipase concentrations should be examined for neoplastic disease.

Pancreatic EUS-FNAC and articular fluid cytology allows a quick and truthful diagnosis of PPP syndrome and an immediate treatment of the patient.

## P13-23 | Evaluating Anal Cancer Screening In A Hospital Setting

M. Rodrigo[1]; G. Parini[1]; A. Lloret[2]; I. Blázquez[3]; A. Quiñonero[1]; E. Romero[1]; M. Pascual[4]; J. Solé[5]; M. Iglesias[1]; F. Alameda[1]; B. Lloveras[1]

*[1]Pathology Department, Hospital del Mar, Barcelona, Spain; [2]Pathology Department, Hospital de Igualada, Barcelona, Spain; [3]Pompeu Fabra University, Barcelona, Spain; [4]Surgery Department, Hospital del Mar, Barcelona, Spain; [5]Gynecology Department, Hospital del Mar, Barcelona, Spain*

**Objectives:** The main cause agent of anal cancer and its precursors, anal intraepithelial lesions, is human papillomavirus (HPV). Men that have sex with men (MSM) and women with a history HPV-related cervical lesions have higher risk of developing anal cancer than general population. The objective of this study is to analyze the current situation of anal cancer screening in our hospital in order to establish new directions if necessary.

**Methods:** Anal cytology cases, mainly from the gynecology and surgery departments, were collected from 2011 to 2017. A database with information on age, sex, HIV status, cytology results, HPV typing and department, was built.

**Results:** In the study period, 339 anal liquid cytology samples were collected, 104 (30.7%) from women, and 235 (69.3%) from men. One hundred twenty-one (41%) corresponded to HIV+ patients and 95 of these (78.5%) were men. Regarding the detection of HPV, 246 cases (72.6%) were positive, of which 204 (82.9%) belonged to high-risk types. The prevalence of low and high-grade squamous intraepithelial lesions (LSIL/HSIL) was 5.8% and 41.8% respectively. One of the cases corresponded to a squamous carcinoma. The rate of ASCUS was 5%. The amount of insufficient cytology samples was 1.1%. The department of Gynecology was the source of 15% of the cytology samples and the rest came mainly from Surgery. Regarding 11 biopsies performed by anoscopy, 4 of them were AIN III, 4 did not show squamous epithelium, 2 were normal, and 1 was AIN I. Most of the patients were referred to another hospital.

**Conclusions:** We have confirmed that there is not a well-established screening program for anal cancer in the hospital. The results support the need to write an anal cancer screening protocol for the population at risk between the departments involved and to monitor the patients to achieve early diagnosis and treatment.

## P13-24 | Eus-Fna Of Pancreatic Lesions: One Year's Data Since Its Introduction In A Greek Regional Hospital

E. Voudoukis; G. Kazamias; A. Rapti; A. Xekalou; E. Chliara; M. Velegraki; E. Mastorakis

*Venizeleion General Hospital, Heraklion, Crete, Greece*

**Objectives:** Endoscopic ultrasound (EUS) has been widely accepted as the gold standard diagnostic technique for evaluating solid and cystic pancreatic lesions, combining echo imaging and EUS-guided fine needle aspiration (EUS-FNA). Over the last year, we started practicing this technique in our institution, which is the referral centre for EUS patients from all over Crete. By studying our data, we aimed to present the significant contribution of Cytology in the primary evaluation of patients with pancreatic masses in our region.

**Methods:** Between April 2017 and January 2018, 31 male and 15 female referring patients (mean age 66) underwent EUS-FNA. Equipment used is the Olympus GF-UCT 180 echoendoscope and the Olympus EU-ME2 Premier processor. The operating gastroenterologist used Boston Expect Slimline 19, 22 and 25G needles or Boston Acquire 22 and 25 needles. All solid pancreatic masses were evaluated on site by a cytopathologist, using Diff. Quick stain on air dried direct smears. The remaining specimens were Pap or May Grunwald Giemsa stained. All needle rinsed as well as visible tissue fragments and blood clots were placed in CytoLyt (ThinPrep®) solution, or, depending on size, in formaldehyde solution for histopathological evaluation. Immunocytochemistry was performed in a small number of samples.

**Results:** By using the Papanicolaou Society of Cytopathology Reporting System 18 cases were classified as positive for malignancy (ductal adenocarcinoma), 9 cases as suspicious for malignancy (8 cases suspicious for ductal adenocarcinoma, 1 case suspicious for acinar cell carcinoma), 3 cases as neoplastic, 2 cases as atypical, 9 cases as negative

and 5 cases as nondiagnostic. High diagnostic concordance with histopathology, regarding suspicious and malignant cases, was observed.

**Conclusions:** Our first year attempt in evaluating and reporting EUS-FNA pancreatic lesions was well accepted by the clinicians. This encourages us to continue and improve this diagnostic method for the best possible management of these patients in our region.

## P13-25 | Pancreatic Neuroendocrine Tumour Grading On Endoscopic Ultrasound-Guided Fine Needle Aspiration: A Study Of 14 Cases

J. Martín López; G. G. Yange Zambrano; J. B. García Reyero; J. Martínez-Echevarría Gil-Delgado; M. Martino González; M. A. Revuelta González; M. L. Cagigal Cobo

*Hospital Universitario Marqués de Valdecilla, Santander, Cantabria, Spain*

**Objectives:** Endoscopic Ultrasound-guided Fine Needle Aspiration Cytology (EUS-FNAC) is the most common procedure to obtain cytological specimen of pancreatic lesions.

The 2017 WHO classification uses both mitotic count and Ki67 immunolabelling index to assign grades to pancreatic neuroendocrine tumors (PNETs).

The objective of this study was to evaluate the role of EUS-FNAC in the diagnosis of PNETs with special emphasis on the accuracy of Ki67 index to predict a final grade.

**Method:** A retrospective study was performed on the PNETs diagnosed by EUS-FNAC between 2014 and 2017 in Department of Pathology, Hospital Universitario Marqués de Valdecilla. EUS-FNAC was performed with ROSE in all the cases. Smears were stained with Diff-Quik and Papanicolaou stains. Immunocytochemical (ICC) studies were performed in cell blocks with Ki67 and at least two neuroendocrine markers.

**Results:** Ten patients were men, and four patients were women. The mean age of patients was 63.64 years (range, 52–76 years). Tumors were located in the body (6), tail (4) and head/uncinate (4). EUS revealed a solid, hypoechoic tumor in 12 cases and cystic-like appearance in 2 cases. In 2 patients, EUS also revealed multiple metastases and surgery was not performed (unresectable tumors). Ten patients underwent surgery.

Sensitivity of EUS-FNA for the diagnosis of a PNET was 85,7% (14 cases: 12 confirm neuroendocrine tumor, 1 negative and 1 non-diagnostic).

Correlation between EUS-FNA and resected specimens were 70% using the Ki-67 index in EUS-FNA specimens. Discrepancies were observed between histology and cytology in grade 2 (G2) tumors (3 of 10 cases).

**Conclusion:** The results exhibit good correlation between FNA grade and final grade on surgical resection specimens using Ki-67 index. Determination of Ki67-LI on EUS-FNA of PanNETs should be included systematically.

# P14 PEDIATRIC CYTOPATHOLOGY

## P14-1 | Diagnostic Role Of Fine-Needle Aspiration Cytology In Wilms Tumour

L. Leça; C. Lobo; P. Monteiro; M. Afonso

*Portuguese Oncology Institute of Porto, Portugal*

**Objectives:** Wilms Tumour (WT) (nephroblastoma) is the most common kidney neoplasm in childhood. In our Institution and accordingly to International Society of Paediatric Oncology (SIOP) guidelines, a pretreatment biopsy is performed, either by core needle biopsy (CNB) and/or fine-needle aspiration cytology (FNAC), followed by neoadjuvant chemotherapy and nephrectomy. We aim to evaluate the feasibility of FNAC in the diagnosis of WT.

**Methods:** Retrospective study of all WT diagnosed between 2007 and 2017 (n = 29). Cases with FNAC prior to neoadjuvant chemotherapy were selected (n = 17). Relevant clinical data was collected and correlation between FNAC and nephrectomy was performed.

**Results:** In our series there were 17 children with a female predominance (F:M ratio of 10:7). The mean age at presentation was 3.2 years (range: 0–7 years). The average tumour's size was 81 mm (range: 20–145 mm). One case was bilateral and another one multicentric. Nephrectomy was performed in all cases. Cytological diagnosis was confirmed by histology in the surgical specimens, resulting in a 100% diagnostic accuracy. FNAC revealed varying combinations of blastemal, stromal and epithelial elements, being the triphasic pattern the most common (n = 8). Blastemal component was present in all cases, both on FNAC and the surgical specimen.

**Conclusions:** FNAC provided a correct morphological diagnosis of WT in all cases of our series, demonstrating an excellent diagnostic accuracy in childhood renal masses. When compared with CNB, FNAC alone can act as a reliable, safer and less invasive diagnostic tool to complement the clinical and imagiological diagnosis of WT.

## P14-2 | Cytopathological Features Of Peritoneal Washings In Intrabdominal Undifferentiated Soft Tissue Sarcomas (MFH/USTS) In Children

S. González Rodríguez; M. García; F. Lozano; S. Y. Moreno; M. A. Velásquez; J. E. Apaza; C. Rodríguez; J. Rodríguez Costa

*Hospital General Universitario Gregorio Marañón, Madrid, Spain*

**Introduction:** We present a rare case of intra-abdominal high-grade Undifferentiated Sarcoma/Malignant Fibrous Histiocytoma (USTS/MFH), in a 1 year-old female patient. The histopathological features of peritoneal washings and histological findings after surgery are described.

**Materials and methods:** A 1 year-old female patient with a 2-month clinical history of fever, weight loss, and nonspecific abdominal pain presented to the clinic with a large intra-abdominal mass. Radiological findings in ultrasound and MRI revealed a 11 × 9 × 8 cm intra-abdominal mass which had a radiological aggressive appearance. Before surgery, a sample of peritoneal washing was obtained. The therapy consisted in surgical extirpation, adjuvant chemotherapy and radiotherapy.

**Results:** A diagnostic paracentesis was performed obtaining 3 ml of peritoneal washing of hematic appearance. The cytological extensions showed the presence of numerous atypical cells, sometimes with fusiform shape, and others with organoid appearance. Pleomorphic and hyperchromatic nuclei, with a high mitosis rate, sometimes with prominent nucleoli and generally scarce cytoplasms. There were also areas of necrosis.

After surgery, histologically, we observed a mesenchymal neoplasia, poorly differentiated, with myxoid stroma, which presented solid nests of spindle cells with atypical nuclei and dense chromatin, observing 43 figures of mitosis in 10 HPF. Areas of tumor necrosis were observed (20%).

This neoplasm presented the following IHC findings:

- Vimentin, CD99, bcl-2: Focally positive.
- Actin (HHF and ML), Desmin, TdT, Myoglobin, Myod-1, CD68, CK20, CK19, S100, CD34, CD20, CD79a, Calretinin, Chromogranin, Synaptophysin, Enolase, and H-Caldesmon, were all negative.
- The Ki67 proliferating index was 80%.

**Conclusion:** Intra-abdominal Undifferentiated Soft Tissue Sarcomas in the pediatric age are extremely rare neoplasms. It may be difficult to characterize them, using conventional techniques, therefore it is important to perform immunohistochemical staining, as well as molecular studies, in order to establish the diagnosis.

## P15 URINE CYTOLOGY

### P15-1 | Clnical Impact Of The Atypical Urine Cytology Using On The Paris System For Reporting Urinary Cytology (TPS) In A Secondary Care Spanish Center

R. Tur[1,2]; S. Valverde[1]; M. R. Martín[1,2]; J. Parra[2,3]

*[1]Complejo Asistencial de Ávila, Ávila, Spain; [2]Investigation Unit (UICBE); [3]Investigation Unit (CIBER)*

**Introduction:** Until 2016 our current reporting system for urine cytology was based on this template: unsatisfactory, negative for malignancy, atypical cells (adding notes in favor of benign or uncertain), suspicious and positive for malignancy. In 2017 we started using TPS criteria.

**Objective:** To determine the clinical impact of TPS criteria focusing on atypical and suspicious categories comparing our routine reporting system data and the TPS for urine cytology and the posterior urological management with transurethral resection of bladder tumors (TURBT).

**Methods:** This is a retrospective study over a period of 2 years, 2016–2017. Clinicopathological data were obtained from all the patients with atypical and suspicious voided urine cytology and posterior TURBT.

**Results:** During 2016 a total of 2,520 urine samples were examined; 84 atypical (3.3%) and 97 suspicious (3.84%). A total of 185 patients were followed up with atypical or suspicious cytological diagnosis; of these, 89 underwent TURBT being tumoral 68 (76.4%) and no tumoral 21 (23.6%).

During 2017 a total of 2,639 urine samples were examined; 212 atypical (8%) and 30 suspicious (1,10%). A total of 269 patients were followed up with atypical or suspicious cytological diagnosis; of these, 151 underwent TURBT being tumoral 128 (84.76%) and no tumoral 23 (15.23%).

When using TPS the rate of atypical samples increased 2.5 times (from 84 to 212) and suspicious samples decreased 3 times (from 97 to 30).

**Conclusions:** Impact of TPS criteria for reporting urine cytology in our center has caused a significant increase in the number of atypical cases with a greater number of patients in follow-up and a greater number of cases with early transitional cancer without increasing the number of non-tumoral TURBT.

### P15-2 | Celldetect® Testing For The Diagnosis And Surveillance Of Bladder Cancer In Routine Clinical Settings, Health Service Laboratories, The Royal Free Hospital Experience

S. Qaiser[1]; Dr M. Perez-Machado[2]

*[1]Health Service Laboratories, Royal Free London NHS Foundation Trust site; [2]Department of Cellular Pathology, Royal Free London NHS Foundation Trust, London, UK*

**Background:** There were around 5,400 bladder cancer deaths in the UK in 2014. Cystoscopy is considered as standard of care for BC detection, but it is invasive and relatively expensive. Urine cytology's shows poor sensitivity (48%), particularly in detecting low grade tumours and its relatively high numbers of undetermined readings (atypia or suspicious). In light of the above, there is a need for a better test that will provide higher sensitivity for BC detection.

**Aims:** To assess the sensitivity and specificity of CellDetect in a routine screening, and compare the performance of the stain to standard urine cytology (PAP stain).

**Methods:** Voided urine was collected from patients at RFH cytology lab. Consecutive voided urine samples with sufficient volume were split. Two Confidential ThinPrep slides were produced for each sample; one slide automatically stained with PAP. The second was manually stained with CellDetect®. Slides were categorized to

positive, negative and suspicious. Results were evaluated in comparison to standard of care result (cystoscopy or biopsy). The staining and slide interpretation was done at cytopathology department.

**Results:** CellDetect® correctly identified 100% of the positive cases, while PAP identified only 50% of the cases. The specificity of CellDetect® was 80.5%.

**Conclusion:** CellDetect® was found particularly useful as a reflex test for negative and atypical urine cytology, helping to detect additional tumours without compromising the specificity. The usefulness of the technology should be further evaluated in the adjunctive monitoring of low-risk patients for whom non-invasive surveillance is not recommended because of the low accuracy of existing markers in the correct diagnosis of recurrent tumours, presumably because of their small size.

## P15-3 | The Impact Of The Paris System For Reporting Urinary Cytology: A Single Institutional Experience

A. Oliveira[1]; T. Neves[1]; I. Cunha[1]; R. G. Pastorello[1]; C. Destefani[1]; M. A. Saieg[1,2]

*[1]A.C Camargo Cancer Center, São Paulo, Brazil; [2]Santa Casa Medical School, São Paulo, Brazil*

**Objectives:** We evaluated the performance of the recently proposed Paris System for Reporting Urine Cytology (PSRUC) in comparison to the previous classification used in our service.

**Methods:** All urine cytology specimens evaluated in our department within a 2-year period before the implementation of the PSRUC were included in the study. The slides were reviewed by two cytopathologists and re-classified according to the proposed diagnostic categories of the PSRUC. Percentage of cases within each category from both the original and the Paris systems were calculated, as well as their sensitivity, specificity, negative (NPV) and positive predictive value (PPV), based on available histologic follow-up.

**Results:** In total, 549 urine specimens were included in the study, 39.5% (217) voided and 60.5% (332) instrumented. Patients were predominantly male, with a mean age of 62.9 years (range, 18–88). Cytological reports in the original system were distributed as follows: 1 (2%) non-diagnostic (ND), 455 (82.9%) negative for malignancy, 8 (1.5%) suspicious for low-grade urothelial lesion (LGUL), 5 (0.9%) positive for LGUL, 3 (0.5%) atypia of undetermined significance (AUC), 53 (9.7%) suspicious for high grade urothelial carcinoma (HGUC) and 24 (4.4%) positive for HGUC. Cytological review under the light of the PSRUC's criteria reclassified these cases as follows: 31 (5.6%) ND, 469 (85.4%) negative for HGUC, 25 (4.6%) AUC, 7 (1.3%) suspicious for HGUC and 24 (4.4%) HGUC. Of all cases, 208 (37.9%) had histologic follow-up. Sensitivity, specificity, NPV and PPV were calculated as 68.4%, 82.1%, 94.8% and 35.1%, respectively, in the original system and 75%, 97.2%, 96.9% and 80%, respectively, in the PSRUC.

**Conclusions:** The implementation of the PSRUC was associated with an improved performance of urinary cytology, with higher sensitivity, specificity, NPV and PPV than the previous classification used.

## P15-4 | The Diagnostic Reliability Of Urinary Cytology At Our Institution

R. Oncins; M. P. Coscojuela; J. Martín; V. Calderero; P. Dolezal; G. Cachi; V. Crespo

*Hospital of Barbastro, Barbastro, Huesca, Spain*

**Objectives:** The reputation of urinary cytology (UC) has been stigmatized due to its low sensitivity and specificity. UC comprises a significant percentage of non gynecologic cytology and its number as a method for detection and follow-up of bladder cancer (BC) keeps increasing.

The aim of this study is to know the value of UC for BC detection or surveillance in our hospital.

**Methods:** All liquid-based UC from January 2015 to December 2016 were examined. Cytological diagnosis was reported according to The Paris System (TPS), grouped later in negative or positive categories. Atypical Urological Cells (AUC) were included in negative cases. Patient charts were retrospectively reviewed and age, sex and clinical history (grouped as BC control, hematuria study or others causes) were collected. Biopsy diagnosis was grouped in negative or positive for tumor (carcinoma in situ, non invasive and invasive BC). When pairs of cytology and biopsy were found, sensitivity (SS), Specificity (SP), positive predictive value (PPV) and negative predictive value (NPV) were performed.

As the implementation of TPS was low in 2015 both years were compared.

**Results:** 1,027 UC were studied, 441 from 297 patients were found in 2015 with 11.1% positive cases (AUC included), 47.5% for BC surveillance. 586 UC from 266 patients in 2016 were found, and the positive rate was 11.5%. 52.5% for BC surveillance. The overall group has a mean age of 68.11 ± 13.4, 78.4% males.

45 pairs of patients with UC and biopsy were found in 2015 and 56 in 2016. The value of SS, SP, PPV and NPV were 56%, 60%, 63%, 52% for 2015 and 60%, 75%, 85%, 42% for 2016.

**Conclusions:** Sensitivity and specificity are in the range of published data. The implementation of TPS improves the value of urine cytology

## P15-5 | The Paris System For Urinary Cytology: The Impact Of Subdividing The "Atypical" Category. A Single Institution Retrospective Analysis Of 60 Cases

M. A. Revuelta; M. Martino; I. Lastra; C. Azpiazu

*Valdecilla University Hospital, Santander, Spain*

**Objectives:** Urine cytology has been an essential tool for the detection and surveillance of high-grade urothelial carcinoma (HGUC). As many as 23% of cytology specimens will demonstrate some degree of atypia without meeting the criteria for HGUC. The Paris system subdivided atypia into atypical urothelial cells (AUC) and suspicious for high –grade urothelial carcinoma (SHGUC). In this study, we describe our institution's experience with AUC and SHGUC categories.

**Material and methods:** 60 cases of urinary cytology with atypia in 2016 were selected in our department. All correlating surgical pathology reports of subsequent tissue examination, patient's medical records and urinary smears were review.

**Results:** There were 2,352 urinary specimens categorized 2,155 as negative (91.6%), 103 (4.4%) HGUC, 51 (2.2%) AUC, 30 (1.27%) SHGUC and 13 (0.53%) unsatisfactory. 30 cases of AUC and 30 of SHGUC were review. In the AUC category, 24 men and 6 women (mean age 72 years, range 56–86). 16 cases (53%) had a biopsy result with 9 (56%) HG malignancy, 2 (13%) low grade (LG) malignancy and 5 (31%) negative. 8 (26.7%) without a biopsy had repeated urine cytology 4 negatives, 2 HGUC and 2 AUC. In the SHGUC category, 23 men and 7 women (mean age 65 years, range 48–84). 23 (76%) had a biopsy result with 14 (61%) HG malignancy, 1 (5%) in situ carcinoma and 8 (34%) negative. 3 (10%) cases without biopsy had repeated urine cytology 2 negatives and 1 SHGUC.

**Conclusions:** In our institution, SHGUC category had more biopsy results and HG malignancy diagnosis than AUC category. There were LG malignancy results in AUC and none in SHGUC category. AUC had more repeated urine cytology than SHGUC category and half of them had a negative result. So there were differences between SHGUC and AUC categories.

## P15-6 | The Immunocytochemical Expression Of MUC1 In Urothelial Cell Hyperplasias

V. Mamali; P. Peristeropoulou; K.-M. Gengollari; E. Mendrinou; M. Pantzou; V. Kouli

*St Andrews General Hospital, Patras, Greece*

**Objectives:** The aim of this study is to evaluate the expression of MUC1 antibody in urothelial cells hyperplasias with or without atypia. MUC1 is a transmembrane glycoprotein that is expressed on the apical surface of epithelial cells that line the mucosal surfaces of many different tissues such as lung, breast, stomach, pancreas, intestine. Overexpression of MUC1 is often associated with colon, breast, ovarian, lung and pancreatic cancers.

**Methods:** Voided urine samples of 36 patients (20 cases of urothelial hyperplasias without atypia and 16 cases of urothelium hyperplasias with atypia) have been examined in our institution. The recommended Thin-Prep sample preparation protocol was followed for each urine specimen. The immunochemistry method with two steps polymer detection system (biotin-free) was performed on destained cytologic smears for the detection of MUC1. Cytoplasmic and membranous immunoreactivity of MUC1 was evaluated as positive if present >10% of the stained cells with or without atypia respectively.

**Results:** The expression of MUC1 in hyperplastic urothelium without atypia was predominantly membranous and was noted moderate stain in 50% of hyperplastic urothelium and strong stain in 50% of hyperplastic urothelial too. The expression of MUC1 in hyperplastic urothelium with atypia was cytoplasmic and was noted moderate stain in 25% and strong stain in 75% of cells.

**Conclusions:** These data suggest that MUC1 immunoexpression may play a significant role in detection of atypia in urinary cells hyperplasias.

## P15-7 | Immunocytochemical Expression Of Cytokeratin 20 And Its Diagnostic Utility In Low And High Grade Urothelial Neoplasms

P. Peristeropoulou; V. Mamali; E. Mendrinou; T. Drakatou; A. Giannopoulou; V. Kouli

*St Andrews General Hospital, Patras, Greece*

**Objectives:** Cytokeratin 20 (CK 20) is a type of intermediate filament protein. CK 20 is restricted to superficial and occasional intermediate cells of the normal urothelium of bladder. Aberrant CK 20 expression has been documented in urothelial carcinoma and has proven useful as an ancillary diagnostic aid for urinary bladder tumor. To evaluate the role of immunocytochemical expression of CK 20 as an adjunctive tool in grading urothelial carcinoma.

**Methods:** 38 patients, 22 cases with low grade and 16 cases with high grade urothelial carcinoma provided voided urine samples. The average age of the patients was 65 years (50–85). The recommended Thin-Prep sample preparation protocol was followed for each urine specimen. The immunohistochemistry method with two steps polymer detection system (biotin-free) was performed on destained cytologic smears for the detection of CK 20. Cytoplasmic immunostain of CK 20 was considered as positive in >10% stained cells.

**Results:** Diffuse positive expression of CK 20 was noted in 12 cases (75%) of high grade and 4 (18.2%) of low grade urothelial carcinomas.

**Conclusions:** The expression of CK 20 marker can be determined in urine cytology and its expression is more frequent in high-grade urothelial cell neoplasms than the low grade. Ones we could possibly use this significant difference in expression of CK 20 between low and high grade urothelial neoplasm for helping to assign grade to urothelial neoplasm.

## P15-8 | Urine Cytology As A Screening Method For Polyoma Virus Active Infection

A. Reguera Arias; L. López Solache; M. Calle García; I. Galed Placed; A. Concha López

*Complexo Hospitalario Universitario A Coruña (CHUAC), Galicia, España*

Polyoma virus nephropathy (PVN) occurs in 3% to 4% of renal transplants, causing graft loss in about 50% of cases. Early detection of PVN allows timely immunosuppression reduction with reconstitution of recipient immunity, reduction or elimination of virus, and avoidance of destructive allograft infection.

Identification of cells with viral inclusions, named decoy cells (DC) in urine is widely used as a screening tool for viral replication of or for active infection with PV. Although DC exhibit typical cytopathic changes and four morphological types have been described, they must be differentiate from cells of carcinoma in situ of the bladder (especially types 3 and 4 DC), cytomegalovirus infection (mainly type 2 DC), and giant cells associated with episodes of acute rejection.

The aim of this study is to identify the occurrence of DC and to check the incidence of every one of the its four types using the urine samples from renal receiver patients. To that end, we have studied 27 urine cytologies from 5 unstable transplant recipients that were undergone to solid organ transplantation.

DC were identified in 21 of the 27 cytologies analyzed. Type 1 DC inclusions were found in all 21 samples, type 2 in 6, type 3 in 17 and type 4 in 18. Furthermore, the four types of inclusions were simultaneously seen in 6 samples. In addition, an "apoptotic cell type" was observed in the urines specimens from those patients that were on antiviral treatment.

The presence of DC and the identification of the different PV inclusions in urine cytology can help with the diagnosis of active viral infection and the management of therapeutic interventions and also it is related to the therapy response.

## P15-9 | Celldetect® Improves Performance Of Bladder Cancer Diagnosis Compared To Standard Cytology And Fish

C. Yoffe[1]; B. Wilchfort[1]; K. Gueta-Milshtein[1]; P. Idelevich[2]; P. Iorga[3]; M. Curran[3]

*[1]Micromedic Technologies Ldt. Tel-Aviv, Israel; [2]Prescient Pharma LLC, Canton, MA USA – Micromedic consultant; [3]Greater Boston Urology, Dedham, MA, USA*

**Objectives:** The study was aimed to evaluate the performance of CellDetect® stain in routine clinical use in patients undergoing bladder cancer (BC) assessment in comparison with Papanicolaou stain and FISH.

**Methods:** Voided urine samples were collected from patients with hematuria or under surveillance for BC (with exclusion of patients with catheters, neobladder and ileal conduit). Samples were processed into smears using liquid-based cytology (ThinPrep, Hologic). For each sample, one slide was stained with Papanicolaou (standard urine cytology stain), one slide was stained with CellDetect® and, in most of the cases, specimens were prepared for FISH testing. Cystoscopy and biopsies were used as gold standard for diagnosis.

**Results:** A total of 70 urine samples were tested for CellDetect® and standard urine cytology. Samples included 53 negative and 17 positive cases. 51 of the samples were also tested for FISH. Out of those, determined readings were given to: 34 standard cytology cases, 61 CellDetect® cases and 47 FISH.

The performance of the modalities were computed based on the cases with determined readings, CellDetect® was shown to detect BC with 100% sensitivity compared to 67% for standard cytology and 69% for FISH. Specificity was 83% for CellDetect®, 96% for standard cytology and 65% for FISH.

Undetermined readings comprise of 36 (51%) cases of standard cytology, including 28 (40%) atypical and 8 (11%) suspicious cases. With CellDetect® 8 cases (11%) were reported as suspicious and 1 inadequate (1.4%) while none was reported as atypical. With FISH 4 cases were classified as suspicious (8%).

**Conclusions:** This study highlights the advantages of CellDetect® performance over standard cytology in diagnosing BC. CellDetect® improved the sensitivity of standard cytology by 33%. Furthermore, CellDetect® staining correctly classified 80% of standard cytology atypical readings.

## P15-10 | Diagnostic Effectiveness Of The Paris System In Routine Urine Cytology

U. Aykutlu; B. Sarsık; S. Sen; A. Veral; D. Nart

*Ege University, Izmir, Turkey*

**Objective:** The aim of the study was to analyze the impact of adopting The Paris System (TPS) in reporting urine cytology and its correlation with subsequent biopsies.

**Methods:** Between 2012 and 2016 years, among 854 bladder washing specimens, 113 cases had a histologic follow-up within 6 months were included in the study. These cases were blindly reviewed and reclassified according to TPS. Their original diagnosis and according to TPS diagnosis were compared.

**Results:** When using TPS, suspicious or positive for high-grade urothelial carcinoma (HGUC) category cases increased 1.4 times (from 17 to 23), atypical urothelial cells (AUC) category cases increased 6 times (from 4 to 24) but unlike benign category cases decreased dramatically (from 92 to 66). Among 24 AUC category cases, the histology was heterogeneous. Two cases were high-grade invasive carcinoma, two cases were high-grade non-invasive carcinoma, nine cases were low-grade carcinoma, six cases were dysplasia, five cases were non-neoplastic. With TPS, overall urine

cytology diagnostic accuracy become more sensitive (42.1% to 52.6%) and more specific (76% to 100%).

**Conclusions:** TPS's standardized diagnostic criterias help to improve the performance of the urine cytology but increased case numbers in AUC category shows the need for appropriate management recommendations for that group.

## P15-11 | Implementation Of The Paris System For Reporting Urinary Cytopathology With Cyto-Histological Correlation

A. L. Ferreira[1]; A. Caeiro[1]; A. T. Alves[1,2]; M. G. Gasparinho[1]

*[1]Hospital Prof. Doutor Fernando Fonseca, Amadora, Portugal; [2]Faculdade de Medicina da Universidade de Lisboa, Lisbon, Portugal*

**Objectives:** The aim of the present study is to determine the reporting rate of the categories according to "The Paris System for Reporting Urinary Cytopathology" (TPSRUC) and relate the risk for development of High-Grade Urothelial Carcinoma (HGUC) to the cytological category, when compared to the histological specimen.

**Methods:** We report a retrospective analysis of 182 urinary samples, collected from our institution's database during 2017. Of these, a cyto-histological comparison was conducted in 27 cases (histological specimen received within a 5-month interval).

**Results:** The urinary samples were distributed as follow: Negative for HGUC: 80.8% (147); Atypical Urothelial Cells: 12.6% (23); Suspicious for HGUC: 3.3% (6); HGUC: 2.2% (4); Unsatisfactory: 1.1% (2).

Regarding the cyto-histological comparison, we found that 25% (1) of the cytological Atypical Urothelial Cells were positive for HGUC on the correspondent histology; 100% (2) of the cytological Suspicious for HGUC were positive for HGUC on the correspondent histology; 100% (1) of the cytological positive for HGUC were also positive for HGUC on the correspondent histology.

Of the cytological Negative cases, 15.0% (3) were positive for HGUC on the correspondent histology; this rate increased to 40% (8), when low and high grade histological lesions were included.

**Conclusions:** The distribution of the different categories, in our institution, is within the parameters described in the TPSRUC.

According to our data, the risk of malignancy in each TPSRUC category is concordant with other published data. However, 16.7% of the negative cases in the cytology resulted in a positive biopsy for HGUC. This rate of malignancy is higher than in other cytological classification systems, although it might be related to different clinical settings (first diagnosis vs. follow-up), leading us to believe that other methods should be used to increase the sensitivity.

This analysis is limited by the low number of cases for cyto-histological comparison.

## P15-12 | Miracidia Of Schistosoma Haematobium In Urine Cytology

A. M. Luebke; A. Hinsch

*University Medical Center Hamburg-Eppendorf, Hamburg, Germany*

A sixteen years old girl living in northern Germany with a migration background of an endemic area of S. haematobium, presented with dysuria and haematuria. Ninety milliliters of voided urine were received. Cytospin slides were prepared and Papanicolaou as well as May-Grunwald-Giemsa (MGG) stained.

Cytology revealed abundant neutrophilic granulocytes, eosinophils and a moderate number of eggs of Schistosoma haematobium. The oval-shaped eggs measured ≈ 100 μm in greatest dimension and carried a sharp terminal spine.

Furthermore, there were some ellipse-shaped ciliated organisms with a maximum diameter of 110–120 μm, consistent with miracidia of S. haematobium.

Although it is known that schistosome eggs can hatch in voided urine, it is a rare event and only seldom described in the literature (1).

Biopsy specimen confirmed the presence of numerous, partly calcified eggs of S. haematobium within the wall of the urinary bladder, accompanied by a prominent inflammatory infiltrate with eosinophils and plasma cells.

The cytological diagnosis of S. haematobium in voided urine is simple, due to the characteristic size and shape of eggs and miracidia. However, in our patient population, it is a rare event. Therefore it is important to consider this differential diagnosis, in cases of dysuria and haematuria in patients with a migration background.

**References:**

1. Acosta AM, Tarjan G: Identification of miracidia of Schistosoma haematobium in a bladder wash sample. *Diagn Cytopathol.* 2016;44 (5):413–415.

## P15-13 | MiT Translocation Associated Renal Cell Carcinoma: A Case Report With Voided Urine Cytology Confirmed By TFE3 Immunohistochemsitry

H. Yim; J. E. Kwon; K. B. Lee

*Ajou University Hospital, Suwon, Republic of Korea*

**Objectives:** MiT translocation associated renal cell carcinomas are rare subtypes of renal neoplasm with very few reports describing the cytologic features. Although urine cytology has no value in detection of RCC, RCC rarely can be suspected based on cytomorphology especially when the tumor infiltrates into pelvicalyceal system. We report a rare case of MiT translocation associated RCC detected in voided urine cytology, coupled with ancillary immunohistochemistry.

**Results:** A 44 year-old woman with complaints of right flank and back pain admitted to urology department. Ultrasonography showed a well-

defined mass in the upper pole of the right kidney with enlarged aortocaval lymph nodes. Urine cytology slide of liquid preparation showed clusters of cells with abundant clear or granular cytoplasm, large round nuclei with markedly irregular nuclear membranes and prominent nucleoli. Micropapillary clusters were occasionally found. TFE3 immunohistochemistry using the remained sample showed strong nuclear positivity. Nephroureterectomy revealed a renal tumor showing a mixed nested and papillary architecture with pelvicalcyceal and nodal involvement. The diagnosis was confirmed by TFE3 immunohistochemsitry.

**Conclusions:** Chracteristic cytomorphology of this rare subtypes of RCC can be retained in voided urine cytology and diagnosis can be confirmed by immunohistochemistry on the cytology slide.

## P15-14 | Diagnostic Significance Of Atypical Category In Urinary Cytology

F. Garcia; O. Gibert; F. Perez-Ochoa; M. L. Surralles; X. Morlius; L. Luizaga; P. Pontes; L. Garcia; C. Gonzalez; X. Tarroch

*Hospital Universitari Mutua De Terrassa*

**Objectives:** In urine cytology, there are a significant number of samples diagnosed as atypical; this diagnosis is subjective, and it is difficult to know its clinical significance. The objective of this study is to evaluate the clinical significance of atypical urothelial cells of undetermined significance (AUCUS) and atypical cells suspicious for urothelial carcinoma (ACSUC) diagnoses in spontaneous urine samples (SUS) and bladder washing samples (BWS).

**Methods:** A total of 8,159 SUS were collected from March 2003 to December 2017, and 8,750 BWS from September 2004 to December 2017. We found 840 cases with a cytological diagnoses of ACSUC or AUCUS, but we only included in the study those cases with a follow-up biopsy (FUB) within the next 4 months; there were 334 cases: 150 SUS and 184 BWS.

**Results:** There were 94 cases (1.16%) of the total SUS diagnosed as AUCUS which had FUB (18 negative, 2 urothelial dysplasia, 16 "in situ" carcinoma, 16 low-grade urothelial carcinoma, 38 high-grade carcinoma, 4 secondary neoplasia), 56 cases (0.69%) as ACSUC (12 negative, 8 "in situ" carcinoma, 9 low-grade carcinoma, 24 high-grade carcinoma, 3 secondary neoplasia), 131 cases (1.50%) of the total BWS as AUCUS (37 negative, 2 urothelial dysplasia, 7 "in situ" carcinoma, 40 low-grade carcinoma, 38 high-grade carcinoma, 7 secondary neoplasia), and 53 cases (0.61%) as ACSUC (15 negative, 2 urothelial dysplasia, 7 "in situ" carcinoma, 17 low-grade carcinoma, 12 high-grade carcinoma). 78.73% of the AUCUS and 78.58% of the ACSUC SUS, and 70.22% of the AUCUS and 67.93% of the ACSUC BWS had FUB diagnosed as carcinoma in situ or malignant, including urothelial carcinoma or metastatic malignant tumour.

**Conclusions:** In our series, the diagnosis of atypical cells and atypical cells suspicious for malignancy in urine cytology has a high clinical significance, because in many cases it is associated to the presence of a malignant lesion.

## P15-15 | Correlation Between Cytological And Histologic Studies In Urothelial Carcinoma

D. Fuel Gómez; P. González-Peramato; A. M. Rodriguez; P. López-Ferrer; Y. Brygadyr; D. Roldán Cortés; B. Vicandi

*Hospital Universitario La Paz, Spain*

**Objective:** To study the correlation between cytologic smears diagnosed as "positive for malignancy" in urine samples and the successive biopsies performed to confirm the diagnosis. To compare the results with the published literature.

**Methods:** We search the department database to retrieve all the urine specimens diagnosed as "positive for urothelial carcinoma" in cytologic preparations and selected only the cases which had histologic follow-up. The study was done in the pathology department of our institution during a 5-year period.

**Results:** Out of 21,341 samples (9,736 patients), we found 292 cases (263 patients) that met the criteria. There were 233 men and 59 women. Urothelial carcinoma was found in 232 cases. Carcinoma in situ (CIS) alone appeared in 25 biopsies, invasive urothelial carcinoma (IUC) in 126 cases and together in 98 cases. Ten presented urothelial dysplasia, 3 of them being the only finding. Within the IUC, 185 cases were high grade urothelial carcinomas (HGUC), 28 low grade urothelial carcinomas, 2 plasmacytoid variant, 5 undifferentiated, 2 small cell neuroendocrine carcinomas (NEC) and 1 large cell NEC. Nine G2 urothelial carcinomas were not graded as high or low grade. Five were not urothelial carcinomas, they were adenocarcinomas of prostate (2), cervix (2) and colon (1). There were 24 positive cytologic smears where the biopsy did not revealed malignancy.

**Conclusions:** Urothelial carcinoma was confirmed by biopsy in the 79.4% of the cases. Most of them were HGUC representing the 79.7% of the positive smears. Within the negative cases, 4 had consecutive positive biopsies. The other cytologic smears were reevaluated and 9 were reassigned to suspicious for malignancy. Anyway, we think that the biopsy failed to confirm the diagnosis because the cytologic image was clear. Possible causes could be inadequate biopsy sampling, short follow-up, upper urinary tract carcinomas and metastasis or infiltration from other organs.

## P15-16 | Poliomavirus Versus Carcinoma In Urine Samples, A Difficult Diagnosis. Cito-Histological And Molecular Correlation In A Series Of 32 Cases

J. A. Fernández-García; M. Serra; M. Cerdán; R. Benages; M. Semidey; S. Ubalde; J. Temprana-Salvador; C. Iglesias; S. Ramón y Cajal; C. Dinarès

*Vall d'Hebron University Hospital, Barcelona, Spain*

**Objectives:** Polyomavirus has been reported to be oncogenic due to viral integration into human genome. The risk for bladder cancer

in renal transplant patients is thought to be higher because of its reactivation. The aim of this study is to verify the degree of cytohistological and molecular correlation in cases where atypia is seen and polyomavirus infection is suspected in urine samples.

**Methods:** From urine samples, spontaneous or instrumental, of 32 patients, in which polyomavirus infection has been suspected in the cytology examination and the PCR test has been performed, we have selected those cases that had concomitant biopsy (8 patients).

**Results:** 8 patients, 6 men and 2 women. Ages 51–77 (average 64 years).

| Case number | Diagnosis cytology | Polyomavirus pcr | Diagnosis biopsy | Organ transplant |
|---|---|---|---|---|
| 1 | Indeterminate atypia and degenerative changes | Negative | Renal clear cell carcinoma | No |
| 2 | Suspicious for poliomavirus | Negative | Lung clear cell carcinoma metastasis to the kidney | Kidney |
| 3 | Suspicious for poliomavirus | Negative | Urothelial carcinoma (high grade) | Liver |
| 4 | Suspicious for poliomavirus | Positive | Negative for malignant cells | No |
| 5 | Indeterminate atypia and degenerative changes | Positive | Negative for malignant cells | No |
| 6 | Suspicious for Urothelial carcinoma | Positive | Urothelial carcinoma (low grade) | No |
| 7 | Suspicious for Urothelial carcinoma | Positive | Urothelial carcinoma (high grade) | No |
| 8 | Suspicious for Urothelial carcinoma | Positive | Urothelial carcinoma (high grade) | Kidney |

**Conclusions:** In our series, the usefulness of cytology in the evaluation of atypia for the diagnosis of urothelial carcinoma is demonstrated. Although the polyomavirus is positive, the biopsy usually confirms the diagnosis of carcinoma, suggesting an oncogenic role of the virus, even in non-transplanted patients. The presence of polyomavirus does not reject the existence of a carcinoma. In cases of indeterminate atypia, molecular confirmation of polyomavirus usually excludes the diagnosis of carcinoma while if it is negative it does not rule it out.

## P15-17 | Quality Control In Urinary Cytologies: Our Experience

J. I. Franco; J. Alfaro; I. Marquina; S. Hakim; M. A. Trigo; M. J. Viso; S. Bakali; H. P. Almánzar; R. Bermúdez; A. Sobrino

*Hospital Universitario Miguel Servet, Zaragoza, España*

**Objectives:** Review the quality of the diagnoses in urinary cytology from our department during year 2016.

**Methods:** We have selected all the cases of urothelial carcinoma of the bladder, if there was previous cytologic sample, the correlation between them and, eventually, the discrepancy (negative cytology). We found 83 urinary cytologies with subsequent urothelial carcinoma of the bladder development in biopsy sample, reviewing 11 cases with discrepancy.

**Results:** After exam, 4 samples were not well preserved It was confirmed the diagnostic of negative cytology in 5 cases. Only 2 cases showed discrepancy between the diagnostic and the review.

**Conclusions:** The percentage of the discrepancies has been about 2.4% and we consider that it is a reasonable percentage.

## P15-18 | JC-Nephropathy In Renal Transplant Recipient Detected By Urine Cytology

J. Musayev[1]; E. Farajov[2]; M. Kazimi[2]; R. Rustamov[3]

*[1]Azerbaijan Medical University, Baku, Azerbaijan; [2]Central Hospital of Oil-workers, Baku, Azerbaijan; [3]Institute of pathology, Wald-Klinikum, Gera, Germany*

**Objectives:** Nephropathy due to polyomavirus infection is a rare cause of renal dysfunction in transplanted grafts. BK is the most common type of polyomavirus. However, rare types of polyomavirus such as JC, WU, MC etc. can be seen among renal transplant recipients. Here we present a rare case of JC-nephropathy which noticed by decoy cell positivity in urine cytology.

**Methods:** Clinical findings, results of urine cytology, tru-cut biopsy and nephrectomy specimens of graft kidney were analysed retrospectively.

**Results:** A 49-year-old male patient was admitted to the clinic for routine control in 4th month of his renal transplantation. The serum creatinine level was high and the voided urine sample of the patient was sent for cytological examination. Ten mL urine sample was centrifuged ad two direct smears were prepared. Twelve decoy cells were detected in 10 HPF and the result of examination was reported as high risk decoy cell positivity. Result of polymerase chain reaction (PCR) for BK virus was negative and tru-cut biopsy was taken from graft kidney for correct diagnosis. Characteristic structural changes due to viral cytopathic effect were seen in tubular epithelium and effected cells were positive stained by SV40 in immunohistochemical examination. After that PCR was repeated for

rare types of polyomavirus and JC was positive. The graft failure due to JC-nephropathy was detected in 8th month of renal transplantation and patient underwent graft nephrectomy. Similar alterations were observed in nephrectomy specimen as in tru-cut biopsy sample.

**Conclusions:** Urine cytology is a cost-effective, rapid and non-invasive diagnostic method for detection of polyomavirus infection in renal transplant recipients. Rare types of polyomavirus should be considered in BK negative cases with decoy cell positivity.

## P16 TRAINING AND TEACHING

### P16-1 | Videomicroscopy: A Cost-Effective Modality For Digital Cytology Online Learning Platforms

B. Wu[1]; H. Y. J. Lum[1]; G. H. Goh[1]; M. E. Nga[1,2]

*[1]National University Hospital, Singapore; [2]National University of Singapore, Singapore*

**Aims:** In digital pathology, whole slide imaging (WSI) is an excellent means of digitizing histologic sections. However, cytology, with its three dimensional cell clusters, poses significant challenges to WSI. A less frequently evaluated imaging modality is videomicroscopy.

We explore the use of videomicroscopy in combination with online platforms to present cytomorphologic information for educational purposes.

**Methods:** An Olympus DP22 camera transmitted images from an Olympus BX41 microscope to a workstation, using Olympus CellSens image capture software. Screencast-o-matic, a screencapture programme, was used to record real-time videos of cytologic material; and to edit and annotate video clips.

A prototypical online resource was created using a WordPress based platform, blog.nus. Videos were embedded and linked from Vimeo and Youtube respectively.

**Results:** A prototypical Cytology Media Gallery website was created, comprising two sections:

1. Gynaecologic Cytology – This is a sample online atlas page featuring short clips of differential diagnoses of Hyperchromatic Crowded Groups.
2. Non-Gynaecologic Cytology – This is a self-assessment resource featuring Unknown Cases to test viewers' diagnostic skills. A brief discussion of approach to diagnosis is included for some cases.

Embedded videos were hosted on Vimeo, with links to Youtube to maximize access across geographical locations.

**Conclusions:** Unlike WSI, videomicroscopy enables the demonstrator to record videoclips focusing in real-time through thick tissue fragments, thereby capturing high quality cytomorphologic information for transmission. Video clips can readily be uploaded onto online hosting platforms at no or minimal cost, and embedded into online sites that are inexpensive to create, with text and layout options. Viewers do not require propriety viewing software, which greatly increases the worldwide accessibility of teaching material.

Hence videomicroscopy offers great versatility in terms of applications in education and, potentially, telepathology, combining high quality image capture with online transmission at a cost that is significantly less than using whole slide scanners.

### P16-2 | Continuous Quality Improvement Program And Its Results Of Korean Society For Cytopathology

H. K. Oh[1,2]; S. J. Kim[1,3]; E. K. Han[1,4]; E. J. Jang[1,5]; D. H. Kim[1,6]; Y. H. Choi[1,7]; Y. D. Choi[1,8]; C. K. Jung[1,9]; H. K. Yoon[1,10]

*[1]The Committee of Quality Improvement of Korean Society for Cytopathology; [2]Daegu Catholic University, Daegu, Korea; [3]Dong A University, Busan, Korea; [4]Seoul Clinical Laboratories, Seoul, Korea; [5]Fatima Hospital, Daegu, Korea; [6]Kangbuk Samsung Hospital, Seoul, Korea; [7]Hallym University Han-Gang Sacred Heart Hospital, Seoul, Korea; [8]Chonnam University, Gwangju, Korea; [9]Catholic University of Korea, Seoul, Korea; [10]Inje University Busan Paik Hospital, Busan, Korea*

The Korean Society for Cytopathology (KSC) conducted Continuous Quality Improvement program including QC and QA for cytopathologic laboratories since 1995. 'The Committee of Quality Improvement (CQI)' was carried out annual survey for cytology data of each laboratories and set up of standards for diagnostic accuracy (DA) test. At now 206 institutes in nationwide were participated in the CQI program and accredited by KSC. The QI program and the National Cancer Screening Program have contributed to a reduction in cervical cancer morbidity and mortality.

Annually 4 times of evaluation in QI Program of KSC;

1. Check list for Lab. General (numbers and types of examination, case volume by diagnosis, preparation methods, cytology-histology correlations and No. of cytotechnicians and pathologists, etc.)
2. Evaluation for DA for GYN, Non-GYN and aspiration cytology by slides.
3. Evaluation for DA and specimen adequacy for GYN.
4. Analysis of intra-institutional QA programs and its results.

The results of 'QI Program' were as follows:

1. The total number of cytology specimens (9.3 million in 2016) and LBP are increased from year to year.
2. Distribution of GYN Diagnosis: The ASC accounted for neer 3.0%. The ASC/SIL ratio was about 3:1 as a whole and

showed an upward trend. The serious cytology-histology discrepancy rate was less than 1%.

3. The DA test maintained the rate of discrepancy under 2%. And inadequate specimen rate is under 0.2%.

The continuous QI program of KSC, to avoid false results this should be a paramount activity in quality program. It was important that not only the QI programs but also the continuous education and training of certified personnel. Especially, the statistical data for cytology were contributed for the development of national cancer examination guidelines and project for cancer prevention and treatment.

## P17 NERVOUS SYSTEM

### P17-1 | Diagnostic Pitfall In Myxoid Cns Tumors On Cytology: A Case Of Low Grade Chondrosarcoma Of Petrous Apex

Y. Khonglah; D. M. Shangpliang; H. Nobin; A. Kakoti; P. Phukan

*North Eastern Indira Gandhi Regional Institute of Health & Medical Sciences, Shillong, Meghalaya, India*

**Introduction:** Intracranial chondrosarcomas are rare tumors, constituting less than 0.16% of all intracranial tumors. They are generally low to intermediate grade with indolent growth and low metastatic potential.

**Case report:** We report a case of a 35 year old female who presented with left sided tongue atrophy, tinnitus and headache. The MRI findings were suggestive of a cystic schwannoma in left petrous apex. Intraoperative crush smear sample were sent for examination. The lesion was grossly myxoid. The smears revealed high cellularity displaying sheets and clusters of round to oval cells with abundant cytoplasm and eccentrically placed nuclei. Background showed abundant myxoid substance. Correlating with the radiological findings and the morphological findings of abundant myxoid change, a diagnosis of schwannoma with myxoid degeneration was made. Subsequently excision of the tumor was done and histopathological examination revealed lobules of cartilaginous areas separated by areas of myxoid change. Immunohistochemically, the cells were positive for S-100 and Vimentin and were negative for Pan CK. Based on the histopathological and immunohistochemical findings a diagnosis of low grade chondrosarcoma was made.

**Conclusion:** The diagnostic pitfall on cytological examination in CNS tumors with myxoid elements presenting at an uncommon location was borne out by our case. Awareness of some of these pitfalls and a thorough cytohistological and immunohistochemical correlation should be done in diagnosing such tumors in order to aid in their management.

### P17-2 | Efficacy Of Intraoperative Tissue Diagnosis In Central Nervous System Lesions

B. S. Lyngdoh; Y. Khonglah; J. Mishra; A. Kakati; P. Phukan

*North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, Meghalaya, India*

**Background:** The brain tumours are diverse group of neoplasms originating from the intracranial tissues and the meninges. Each type of tumour has its own biologic characteristics & prognosis. Crush smear or squash smear preparation is an adjuvant in diagnosing CNS lesions on tissue sent for frozen section. Besides rapid decision making during neurosurgical procedures, intraoperative pathological diagnosis also ensures that minimum injury is caused to the normal brain structures surrounding the intracranial neoplasm.

**Objective:** To assess the accuracy of crush smear diagnosis, by comparing it with histopathological section & immunohistochemical correlation

**Methods:** A prospective study of four years was conducted in the Department of Pathology, NEIGRIHMS, Shillong, North-east India. The intraoperative histological diagnosis were made on crush smear preparations. The rest of the tissue is processed for permanent tissue sections. Slides in which there was discrepancy/discordance between the intraoperative and permanent paraffin sections were reviewed to find the reasons for the discrepancy.

**Results:** A total of 66 cases of CNS tumours were sent for intraoperative consultation. Out of these, concordance between intraoperative tissue diagnosis and histopathology was achieved in 55 cases (83.33%). There was discordance in 11 (16.67%) out of 66 cases sent for intraoperative consultation

**Conclusion:** Crush smears are good adjuvant in diagnosing CNS lesions and has a diagnostic accuracy of almost 100% in many CNS tumours.

### P17-3 | Intraoperative Consultation On Rare Central Nervous System Tumors By Squash Cytology: A Case Of Lipomatous Ependymoma Rich In Signet Cell-Like Cells And Literature Review

I. Subhi-Issa Ahmad[1,2]; C. Díaz del Arco[1,2]; E. Aguilar Navarro[1,2]; I. Casado Fariñas[1,2]; M. Saiz-Pardo Sanz[1]; M. C. Polidura Arruga[1]; F. Rascón-Ramírez[1]; L. Ortega Medina[1,2]

*[1]Hospital Clínico Universitario San Carlos, Madrid, Spain; [2]Complutense University, Madrid, Spain*

**Objectives:** Central nervous system (CNS) squash cytology (SC) has established itself as a technically simple, rapid, inexpensive, fairly accurate, and reliable intraoperative diagnostic tool. Although the individual cytomorphologic profiles of most CNS tumors have been described, a comprehensive study of the utility of SC in

intraoperative consultation (IOC) for rare CNS tumors has not yet been undertaken. The range of cytomorphologic appearances, diagnostic dilemmas, and common pitfalls that can occur during IOC for rare vatiants of ependymomas is not well established.

**Methods:** A 71 years old woman presented with progressive gait deterioration for 2 years associated with dizziness. In cerebral CT and later with MRI, a left cerebellar infratentorial solid tumor of 5 × 4 × 3 cm dimensions, is observed, surrounding and partially compressing the IV ventricle, with an intraventricular component, that produce mild herniation and hydrocephalus. Cytological Diff-Quik stained smears obtained by squash cytology of the intraoperative biopsy are reviewed.

**Results:** The smears show a moderately cellular neoplasia of low cytological aggressiveness with papillary projections. The neoplastic cells are vacuolated with eccentric nuclei, similar to adipocytes and signet ring cells. There were no mitosis, necrosis or vascular proliferation, with few gliovascular pseudorosettes and occasional ependymal rosettes. The suggested intraoperative diagnosis is ependymoma with unusual morphological features rich in vacuolated and signet cell-like cells. Subsequent histopathological study with special stains for mucins and broad immunohistochemical panel confirms diagnosis.

**Conclusion:** In the intraoperative diagnosis of CNS, it is important to know the age and history of patient, duration and type and onset of symptoms, radiological findings, and site of tumor before smears evaluation. For rare entities and in the presence of unusual morphologies, it is necessary to keep some fresh tissue for special stains and refer samples for ultrastructural microscopy, as necessary.

## P17-4 | Value Of Intraoperative Smears In The Diagnostic Of Secretory Meningiomas: An Observational Retrospective Study (2010–2017)

J. I. Franco; J. Alfaro; I. Marquina; S. Hakim; M. A. Trigo; M. J. Viso; S. Bakali; H. P. Almánzar; A. Sobrino; R. Bermúdez
*Hospital Universitario Miguel Servet, Zaragoza, España*

**Objectives:** Secretory meningioma, which histologically corresponds to WHO grade I, is a variant of meningioma characterized by the presence of focal epithelial differentiation in the form of intracellular lumina containing periodic acid-Schiff-positive eosinophilic secretion, which is known as pseudopsammoma bodies. Provisional diagnosis, through intraoperative smears, could result in a complete resection for definitive treatment.

**Methods:** Our study is based on an observational retrospective study of 7 patients diagnosed, treated and followed for Secretory Meningiomas at the Universitary Hospital Miguel Servet, Zaragoza, Spain, between 2010 and 2017.

**Results:** All our cases were diagnosed as low grade meningiomas in the intraoperative study and showed the same cytologic features such as pseudoinclusions, small nucleoli or pseudopsammoma bodies.

**Conclusions:** Although it is not compulsory to determine the exact type of meningioma during the intraoperative study, sometimes it is possible to confirm it, considering that cytologic smears are often more specific than frozen sections in the diagnostic of secretory meningiomas.

## P17-5 | Central Neurocytoma: Cytological Features And Histological Confirmation Of An Uncommon Neoplasm

J. I. Franco; I. Marquina; J. Alfaro; S. Hakim; M. A. Trigo; M. J. Viso; S. Bakali; H. P. Almánzar; R. Bermúdez; A. Sobrino
*Hospital Universitario Miguel Servet, Zaragoza, España*

**Objectives:** Central neurocytoma is an uncommon intraventricular neoplasm composed of bland uniform round cells with a neuronal immunophenotype and low proliferation index. The differential diagnosis, tissue correlation and ancillary studies are discussed.

**Methods:** We report a case of a 35-year-old man who presented an intraventricular neoplasm in the right ventricle. Based on the radiological findings, the tumor was clinically diagnosed as a non glial neoplasm. Our intraoperatory diagnostic with scrape citology was low-grade non glial neoplasm.

**Results:** Cytological smears showed a cellular tumor composed of round monomorphic uniform-sized cells set in a background of fibrillary matrix of neuropils. Tumor cells displayed finely stippled granular chromatin, with scanty cytoplasm. Nuclear pleomorphism, mitotic figures or necrotic debris were absent.

Histologically, the lesion was composed of small monomorphic cells with round or oval nucleus, with finely speckled chromatin, variably present nucleoli and capillary blood vessels arranged in an arborizing pattern and with focal calcifications. The cells expressed synaptophysin and GFAP, stain negatively for chromogranin and neurofilament, and a Ki-67 proliferation index lower than 1%.

**Conclusions:** We present an unusual but distinctive entity, with cytological features and its tissue correlation and a favourable prognosis. Differential diagnosis includes oligodendroglioma, clear cell ependymoma and non-Hodgkin lymphoma.

# P18 OTHERS

## P18-1 | Study Of The Cytological Composition Of Palatine Tonsils Crypt Content For Determination Of Their Functional State In Patients With Chronic Tonsillitis

I. Volhina[1]; I. Gavrylenko[2]
[1]*Ukrainian Reference Centre for Clinical Laboratory Diagnostics and Metrology, National Pediatric Specialized Hospital "OHMATDYT" of Ministry of Public Health of Ukraine; Kiev, Ukraine;* [2]*P. L. Shupyk National Medical Academy of Post-Graduate Education, Department of Pediatric Otorhynolaryngology, Audiology and Phoniatry; Kiev, Ukraine*

**Objectives:** The goal of the research was to study cellular composition of palatine tonsils' crypt content. This study allows to clarify the form of chronic tonsillitis, to evaluate preservation and reserve capacities of the tonsils lymphoid tissue. Microscopic examination gives preliminary information on the amount and composition of microflora, in some cases it can be the only way to detect protozoa. Repeated cytological examinations give an opportunity to observe changes in the cellular composition of tonsils crypt content during the course of treatment and make a conclusion concerning the effectiveness of certain medicaments, as well as to assess the reserve capabilities of the tonsils lymphoid tissue in a particular patient.

**Methods:** We've chosen a technically simple, accessible and not disturbing method for patients in selecting material for the study. The cytological conclusion concerning functional state of the tissue of palatine tonsils was given based on the ratio of cellular elements, primarily the proportion of lymphoid elements in the preparation of crypt contents, as well as the amount and variety of microflora.

**Results:** The following cytological groups were identified.

1. Good functional ability of lymphoid tissue of palatine tonsils.
2. High activity of lymphoid tissue of palatine tonsils.
3. Compensated functional capacity of palatine tonsils.
4. Decompensation of palatine tonsils functions.

The study gave possibility to detect different degrees of oppression of the tonsils lymphoid tissue functions in the patients with the same clinical diagnosis. It helped physician to clarify the form of chronic tonsillitis and determine the treatment tactics.

**Conclusions:** The cytological study of the palatine tonsils crypt content can serve as an additional method for assessing the functional state of the tonsils, the reserve capacity of the lymphoid tissue, clarifying the diagnosis of chronic tonsillitis, determining its form and the effectiveness of treatment.

## P18-2 | Cytological Examination Of Effusions With The Contribution Of Immunocytochemistry. A 1-Year Retrospective Study

N. Koufopoulos[1]; K. Kosmas[2]; G. Mitropoulou[3]; E. Tsouma[4]; A. Alexiadou[4]; S. Plyta[4]

*[1]Cancer Hospital of Athens "Saint Savvas", Greece; [2]General Chest Diseases Hospital of Athens "SOTIRIA", Greece; [3]Children's Hospital Athens "Agia Sofia", Greece; [4]Cancer Hospital of Piraeus, "METAXA", Greece*

**Objectives:** The cytological examination of the fluids is considered an important diagnostic tool in detecting the cause of the fluid collection in the body cavities. The main utility is to identify a malignancy and our purpose was the evaluation of the results of the cytological examination of pleural, peritoneal and pericardial effusions with the contribution of immunocytochemistry.

**Methods:** Retrospective study of the results of the cytological examination of 1,567 pleural, 35 ascites and 41 of pericardial fluids of the year 2017. Most of our patients had more than one sample. The smears were processed by the conventional method and stained with Pap technique. Several combinations of immunocytochemical markers were applied in correlation to cell morphology and patient's history (WT-1, CEA, S-100, HMB-45, EMA, Vimentin, LCA, TTF-1, CD56, Calretinin, CK7, CK20, etc.)

**Results:** A total of 1,643 cases were identified as:

1. Negative for malignancy 1,251
2. Suspicious for malignancy 144
3. Positive for malignancy 248 cases, out of which the origin of malignant cells was detected either morphologically alone or in combination with the use of immunocytochemical markers. More precisely 18 breast, 7 ovarian, 3 stomach, 1 liver, 2 cholangiocarcinomas, 1 kidney, 3 bladder, 1 prostate, 3 mesotheliomas, 2 melanoma, 1 multiple myeloma, 2 lymphoma, 141 lung adenocarcinomas, 21 small cell carcinomas, 4 squamous carcinomas and 38 tumors of unknown primary origin.

**Conclusions:** Although in several body cavities malignant neoplastic cells are relatively easy to recognize, there are some cases where the site of primary origin is not easy to identify and a question arises as to whether it is a primary neoplasm or a metastatic one. As we have seen from our study, the use of immunocytochemistry technique contributes to a safe conclusion and can help to organize an appropriate therapeutic strategy for the survival of these patients.

## P18-3 | Chondrosarcoma Of Bone At Unusual Sites-Report Of Three Cases

R. G. W. Pinto; R. Manjula; S. Misbah

*Goa Medical College, Bambolim, Goa, India*

Chondrosarcoma is a malignant tumor of cartilage forming tissues that range from low grade tumors with low metastatic potential to highly aggressive neoplasms. They are most commonly found in older patients within the long bones and can arise de novo or secondary from an existing benign cartilaginous neoplasm. Most common sites involve the pelvic bones, ribs and shoulder girdle. Chondrosarcoma of small bones of the hands and feet are rare.

The aim of this study was to evaluate the incidence and features of chondrosarcomas of bone at unusual sites.

We describe 3 cases of chondrosarcoma first patient aged 60 years, goldsmith by occupation presented with swelling of index finger. Second patient was a 31 year old male who presented with left clavicular swelling. Third patient was a middle aged male who presented with a rib swelling.

Radiologically they were osteolytic and infiltrative destructive lesions with areas of calcification.

FNA of the index finger lesion and the rib swelling was reported as malignant cartilaginous neoplasm.

On gross examination all the tumors were whitish with glistening appearance.

Microscopically the tumor mass comprised of lobules of cartilage showing hypercellularity with hyperchromatic, pleomorphic nuclei with areas of calcification.

All three were reported as chondrosarcoma.

## P18-4 | FNAC Supplemented With Immunocytochemistry Improves The Final Diagnosis

P. Katoch; P. Asschenfeldt

*Aalborg University Hospital, Aalborg, Denmark*

**Objectives:** Fine needle aspiration cytology (FNAC) is the procedure of choice for rapid diagnosis of neck masses. Combing immunocytochemistry (ICC) on direct smear specimens improves diagnostic accuracy, as illustrated by these 3 case reports.

**Material and methods:** Case 1: Male 55 with no history of (h/o) cancer presented with bilateral neck masses. Normal ENT exam. 5 FNA smear slides (left side) & 4 slides (right side), received. Slide one on both specimens stained with standard MGG.

Case 2: Male 65 with no h/o cancer presented with right side neck mass. ENT exam: No tumor identified. 4 FNA slides, 2 stained with MGG.

Case 3: Female 67 with previous h/o endometrioidt adenocarcinoma of the uterus (2012), presented with multiple PET positive lymph nodes. FNAC from right neck node, 4 slides.

**Results:** Case 1: Both slides evaluated as malignant epithelial cells. ICC for TTF, CK5, Synaptophysin (SYP), CD45, SOX 10 & CDX2 performed. TTF & SYP were positive, while the rest was negative. Diagnosis of metastasis - small cell carcinoma with lung primary was given, & later PET scan confirmed a lung tumor with metastases.

Case 2: Evaluated as small groups of carcinoma cells with no identifiable keratinization. ICC for CK5 & P40 showed a few CK5 positive cells & universal positive P40. Diagnosis of metastasis - squamous cell carcinoma, probably poorly differentiated was given.

Case 3 First slide stained for MGG was evaluated as adenocarcinoma cells. ICC for PAX8, TTF & CK5 revealed strong PAX8 positivity while the rest was negative. Diagnosis of metastasis-adenocarcinoma compatible with primary in the uterus was made.

All 3 patients were directly referred to Oncology.

**Conclusions:** The use of ICC on direct FNA smears has lead to increased diagnostic accuracy & rapid final diagnosis resulting in faster patient referral to specific treatment protocols.

## P18-5 | The Pivotal Role Of Liquid Based Cytology (LBC) In The Multidisciplinary Diagnostic Investigation: Case Report Of A Patient With Two Different Malignancies In A Short Period Of Time

G. Kazamias[1]; E. Vourliotaki[1]; E. Chliara[1]; G. Georgiou[1]; P. Katafygiotis[2]; E. Mastorakis[1]

*[1]Venizeleion General Hospital, Heraklion, Crete, Greece; [2]National and Kapodistrian University of Athens, Greece*

**Objectives:** Cytology is a first step medical procedure in diagnosing malignancies. LBC constitutes a well accepted method, due to its ability in evaluating morphologic and immunocytochemistry findings on the same sample. We report a case presenting two different malignancies, first diagnosed by cytology, over a period of 7 months.

**Methods:** In a female asymptomatic patient of 68 years, a thyroid ultrasound scan revealed nodular lesion of 0.75 cm with suspicious imaging findings. A subsequent US-FNA examined on LBC (ThinPrep®), had a TBSRTC-VI consistent with papillary carcinoma report. The histological examination after total thyroidectomy, showed a multifocal papillary carcinoma, max focus 0.9 cm, without any capsular invasion or extrathyroidal extension.

**Results:** Neck ultrasound before thyroidectomy was negative for lymph node invasion. Four months later, she was administered of 100 mCi $I^{131}$ for thyroid remnant ablation. Post ablation whole body scan showed a little remnant in the thyroid bed. In the patient's follow up 3 months later, a neck ultrasound showed lymph nodes suspicious for malignancy, bilaterally. A lymph node US-FNA examined on LBC (ThinPrep®), reported a metastatic carcinoma not expressing Cytokeratin 19, HBME-1, Calcitonin and Thyroglobulin, but expressing TTF-1, Synaptophysin and CD56. A chest CT scan was negative for neoplastic lesion. Additionally, a brain CT scan, was also normal. The patient underwent bilateral lymph node dissection. Histology showed invasion of a Large Cell Neuroendocrine Carcinoma. A chest CT scan, 3 months after the first, showed pathologically involved mediastinum lymph nodes, as well as a neoplastic lesion of max diameter 4.17 cm in the upper right lobe. Staging of the disease revealed a metastatic lesion d = 2.14 cm in the cerebellum. She continued to be asymptomatic.

**Conclusions:** The defining primary cytological diagnoses in our case, confirm the pivotal role of LBC in the patient management, due to its ability of ancillary techniques on the same sample.

## P18-6 | Medullary Thyroid Carcinoma – A Study Of 7 Cases

R. G. W. Pinto; P. Mashelkar; D. Prabhugaonkar; A. Fernandes; P. Nayak

*Goa Medical College, Bambolim, Goa, India*

Medullary carcinoma of thyroid are the neuroendocrine neoplasms, arising from the c cells (parafollicular cells) of the thyroid and has a wide clinical and histopathological spectrum. It can either arise sporadically or as a part of MEN 2A/2B syndrome or as familial tumor without MEN syndrome. Sporadic cases are usually elderly individuals, while it typically occurs in 3rd or 4th decade in MEN 2A, early childhood in MEN 2B, middle age in Familial MTC. We report, 7 cases of medullary carcinoma of thyroid which presented with a midline neck swelling. FNAC done, was characterised by eccentric nuclei, 'neuroendocrine type' chromatin, inconspicuous nucleoli, binucleated and multinucleated cells and clear cell background. Grossly, the tumors were solid, firm, non encapsulated but relatively well circumscribed and had a gray to yellowish cut surface. Microscopically, the tumor was composed of polygonal to spindle shaped cells forming nests, trabeculae and follicle. Acellular amyloid deposits were also present in the stroma. Imaging studies, calcitonin and CEA levels were also done in the above patients.

## P18-7 | Genetic Polymorphism Of Pigs (*Sus Scrofa Domestica*) Of Ukrainian Meat And Welsh Breeds According To Cyto-And Molecular-Genetic Markers

M. Drahulian; S. Kostenko; T. Dorosch

*National University of Life and Environmental Sciences of Ukraine, Kiev, Ukraine*

**Introduction:** Despite all the efforts of geneticists-breeders, the reproductive qualities of the saints are characterized by a low degree of inheritance. One of the reasons for this is the high level of polymorphism in the pig population over the whole spectrum of genes. The polygenetic inheritance of reproductive qualities is poorly understood in terms of the complex effect of genotypes of different genes.

**Aim:** The thesis is dedicated to identifying the patterns of breed-specific polymorphism of Ukrainian meat and Welsh breeds of *Sus scrofa domestica* according to cyto- and molecular-genetic markers and modeling of markers of breed profiles.

**Methods:** Using PCR – RFLP we studied inter-breed features of four genes polymorphism, associated with reproductive function of sows of Welsh and Ukrainian meat breeds in SME "Hontarivka" in Kharkiv region: follicle stimulating hormone receptor (*FSHR*), co-activator of nuclear steroid hormone receptors (*NCOA1*), estrogen receptor1 (*ESR1*), prolactin receptor (*PRLR*) (2010–2011).

**Results:** We conducted the cytogenetic analysis of sows of Ukrainian meat and Welsh breeds, established the associations between the level of lymphocytes with micronucleus and the number of piglets born from Ukrainian meat breed sows ($r = -0.54$, $p < 0.05$) and from Welsh breed sows ($r = -0.70$, $p < 0.01$). We observed the high rates of reproductive function in sows with alleles $NCOA1^{A1}$, $ESR1^{B}$, $FSHR^{C}$, $PRLR^{A}$ in the genotype.

**Conclusions:** We identified and summarized the patterns of breed-specific polymorphism of Ukrainian meat and Welsh breeds pigs in regards to the complex cyto- and molecular-genetic markers that are associated with reproductive abilities of sows. Based on the identified breed-specific cytogenetic and molecular-genetic characteristics of sows we suggested the technique of creating profiles of individual marker genetic pool of pigs in SME "Hontarivka".

## P18-8 | Transformation CMML To AML: Unusual Cytomorphologic Presentation. A Case Report

S. Ries; R. Kanić; L. Kurić; J. Antulov; L. Beljan; K. Dubravčić; A. Babić; H. Lalić; R. Vrhovac; K. Gjadrov Kuveždić

*University Hospital Center Zagreb and School of Medicine, Zagreb, Croatia*

**Background:** Chronic myelomonocytic leukemia (CMML) is a malignant hematopoietic stem cell disorder with pathological features of both a myeloproliferative neoplasm (MPN) and myelodysplastic syndrome (MDS). Diagnosis requires the presence of persistent monocytosis and dysplasia involving one or more myeloid cell lineages. CMML is associated with higher rate of progression to acute myeloid leukemia (AML).

**Case report:** A 54-year-old man with a 4-week history of CMML was admitted to the hospital. He had fatigue, fever, night sweating and increased white blood cell count (WBC). Bone marrow fine needle aspiration (FNA) biopsy was performed.

**Results:** Sternal bone marrow aspirate revealed 17% of large blast cells with basophilic cytoplasm and 61% of promonocytes, which were alpha naphthyl acetate esterase (ANAE) positive and inhibited by sodium fluoride (NaF). In peripheral blood, the majority of blasts were small, myeloperoxidase (MPO) positive, with Auer roads. Bone marrow blasts (monoblasts) had morphological features completely different from blasts (myeloblasts) in peripheral blood. Abnormal monocytes were found in both, bone marrow and peripheral blood. Flow cytometric immunophenotyping of bone marrow sample demonstrated cells with many features consistent with monocytic differentiation- $CD33^{bright}CD15^{+}CD14^{+/-}CD64^{+}CD4^{+}HLA\text{-}DR^{+}$lysozyme$^{+}$ (81%) - of which major component (65%) consisted of promonocyte-like cells ($CD14^{-}CD64^{+}HLA\text{-}DR^{+}$), with remaining mature monocytes (16%) and immature $CD117^{+}$ myeloid cells (6%), respectively. Peripheral white blood cells consisted of lymphocytes (43%), immunophenotypically mature $CD14^{+}HLA\text{-}DR^{+}$ monocytes (37%) and immature $CD117^{+}$ myeloid cells (10%). Furthermore, an abnormal karyotype, 45, X, -Y, /46, XY was found. Molecular studies detected *NPM1*, *FLT3* mutation.

**Conclusion:** Multiple studies have demonstrated that interaction with the bone marrow stromal microenvironment contributes to the survival of leukemia cells. Recent studies have suggested that chemokine/receptor relationship is an important pathway in hematologic

malignancies. One explanation for unusual distribution of blasts in our case is the interaction between chemokine receptor family.

## P18-9 | Third Primary Malignant Neoplasm In The Same Patient Diagnosed By FNA. A Case Report

P. Peristeropoulou; V. Mamali; E. Mendrinou; E. Christodoulis; V. Kouli
*St Andrews General Hospital, Patras, Greece*

**Objectives:** A 71 years old woman with a recent history of a squamous cell carcinoma in the right upper lip and a gastric adenocarcinoma ten years ago, presented with enlarged neck lymph node detected during physical examination.

**Methods:** Fine-needle aspiration of the neck lymph node was performed and the material was sent for cytological evaluation. From aspirated material were prepared smears with conventional and liquid-based cytology methods and they were stained by Papanicolaou and May Grünwald Giemsa staining.

**Results:** Cytological characteristics of the neoplasm were not compatible with two previous primary carcinomas. The examination of smears showed the presence of several papillary structures of tumor cells. On close inspection the cells had spherical or oval nuclei with irregular contours. The chromatin was finely dispersed, giving the nuclei a ground-glass appearance. Were also noticed few nuclei with grooves and rare nuclei with intranuclear cytoplasmic inclusions. In the immunocytochemistry the tumor cells were thyroglobulin and cytokeratin 19 positive. A diagnosis of a papillary carcinoma of thyroid was made which was confirmed by histopathology.

**Conclusions:** The diagnosis of a third primary malignant neoplasm in a patient is rather uncommon and the FNA cytology is an accurate diagnostic tool for appropriate treatment.

## P18-10 | Endoscopic Ultrasound-Guided Fine Needle Aspiration In Pancreatic Tumors – Correlation Between Imagistic And Pathologic Findings

M. Farcas[1]; M. Rimbas[1]; L. Nichita[1,2]; M. Cioplea[1,2]; L. Zamfir[1]; L. Tutuianu[1]; C. Popp[1]
*[1]Colentina Hospital, Bucharest, Romania; [2]Carol Davila University of Medicine and Pharmacy, Faculty of Dental Medicine, Bucharest, Romania*

**Objectives:** Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) is used for diagnosis of inoperable pancreatic malignancies with high sensitivity, specificity and accuracy. Best method includes 5-6 FNA passages and combined cytology-histology examination. Studies show a significant drop of sensitivity and accuracy when just cytology or histology are used. Our study presents the experience of a new center including a multidisciplinary team (gastroenterologists, pathologists, anesthetists, nurses and technicians).

**Methods:** We present a retrospective cohort study including 195 consecutive patients with imagistic criteria for pancreatic malignant solid tumors. All patients underwent a EUS-FNA in the presence of a cytopathologist in the operating room. Harvested material was macroscopically examined and, if considered appropriated, cytology smears were obtained. In all cases, the remaining material was routinely processed and embedded in paraffin. Multiple sections for usual, special and immunohistochemical stains were obtained and examined by two pathologists. Patients were divided in three diagnostic categories: malignant, negative for malignancy and indeterminate for malignancy (insufficient material, unspecific changes).

**Results:** Our cohort included 86 females and 109 males with a median age of 65 (38 to 86). Histology alone was used in 149 cases and had a sensibility of 62.1% and an accuracy of 64%. In 46 cases was used combined cytology-histology diagnosis and the sensibility of this method was 52.4%, while the accuracy was 63.7%. Insufficient material was found in 8.7% cases in combined group and in 12.1% cases in histology group (difference not statistically significant, Fisher's test two-tailed $p = 0.6062$).

**Conclusions:** In our study, combined histology-cytology was inferior to simple histology. The most probable cause is that combined method was chose when macroscopic examination revealed small amounts of tissue. Since in the combined group were less cases with insufficient material, this method is useful when the EUS-FNA is not obtaining a satisfactory amount of tissue.

## P18-11 | Evolution Of Fine-Needle Aspiration Studies At Mutua Terrassa University Hospital 2004–2017

X. Tarroch; L. Luizaga; P. P. de Sousa; L. García; C. Gonzalez; F. Perez; R. Albero; C. Ferrer; C. Baez; P. Forcada
*Hospital Universitari Mútua Terrassa*

**Objectives:** Fine Needle Aspiration (FNA) is a technique that has demonstrated its efficacy and diagnostic utility. In recent years, its use in some organs has been decreasing to the detriment of other diagnostic techniques. The aim of the study is to analyze the evolution of the use of FNA in our hospital between the years 2004–2017.

**Methods:** All the FNAs of solid organs, performed in our hospital in the period 2004–2017, have been reviewed. We have calculated in each year, the total number and its distribution in the different locations, analyzing its global evolution, and comparing the periods 2004–2012 and 2013–2017.

**Results:** The total number of FNAs decreased by 29.3% between 2004 and 2012, from 734 to 519. However, in the 2013–2017 period we have had an increase of 95.4%, from 519 to 1,014, this represents an increase of 38% between 2004 and 20167. By organs,

comparing both periods, we observed a decrease in breast punctures of 41%, liver of 53%; lung 67%, the head and neck remained stable, and an increase in the number of thyroid punctures of 36%, lymph nodes of 19% and pancreas 760%. The latter due to the incorporation of Ecoendoscopic punctures.

**Conclusions:** Although breast, liver and lung punctures have decreased, we have had an increase in the global number of FNAB in recent years, especially due to the increase in punctures of pancreas, lymph nodes and thyroid. This was because the creation of Endoscopic Ultrasound (EUS and EBUS) and thyroid units in our hospital.

## P18-12 | Cytological Diagnosis Of Cerebrotendinous Xanthomatosis In Two Siblings Presenting With Bilateral Ankle Swellings And Neurological Decline

S. Mathur[1]; A. Nambirajan[1]; G. S. Anju[1]; A. Garg[2]; R. Bhatia[3]; M. C. Sharma[1]; D. Jain[1]; V. K. Iyer[1]

*[1]Department of Pathology, AIIMS, New Delhi, India; [2]Department of Neuroradiology, AIIMS, New Delhi, India; [3]Department of Neurology, AIIMS, New Delhi, India*

**Objectives:** To present an interesting clinical scenario where the cytological diagnosis of xanthomas led to the final diagnosis of cerebrotendinous xanthomatosis (CTX).

**Methods:** Two female siblings aged 23 and 25 years, born of non-consanguineous marriage, were referred for FNAC of bilateral progressive and painless ankle swellings for the past 5–6 years. The siblings were observed to be growth stunted with mild cognitive impairment. Fine needle aspiration cytology (FNAC) of the bilateral ankle swellings, followed by a wedge biopsy were performed. Papanicolaou & May Grünwald Giemsa stained smears were analysed.

**Results:** Aspirates from ankle swellings from both revealed many giant cells with foamy cytoplasm with numerous cholesterol crystals in the background, consistent with tendinous xanthomas. Considering the autosomal recessive type of inheritance and clinical history, the diagnosis of CTX was considered. Further work-up revealed deranged lipid profiles and hyperintense lesions in dentate nuclei. Patients were started on ursodeoxycholic acid and reported softening of the tendon swellings at last follow-up 6 months following start of treatment.

**Conclusions:** Xanthomas are a common manifestation of many rare inherited and acquired lipid storage disorders, warranting a complete metabolic and genetic workup. Early diagnosis and treatment with chenodeoxycholic acid leads to improvement in neurological symptoms. Cytological diagnosis by FNAC of with classical giant cells and cholesterol crystals gives an early lead to the diagnosis of this condition.

## P18-13 | Utility Of FNAC In Diagnosis Of Subcutaneous Metastatic Deposits

H. Sarin; J. Jain; S. Kakkar; A. Vaid

*Medanta - The Medicity, Gurgaon, India*

**Objectives:** To study the cytological spectrum of subcutaneous lumps diagnosed as metastasis deposits on FNAC.

**Methods:** A retrospective audit of all subcutaneous nodules diagnosed as metastasis on FNAC from January 2014 to Dec 2017 was performed. Cell Block – Immunocytochemistry (CB-ICC) was done wherever feasible.

**Results:** Out of 140 patients with subcutaneous nodules who underwent FNA, 22 showed metastasis. In 18 patients the primary was known and in 4 patients it was unknown. The most common site of subcutaneous nodules in our study was chest wall, followed by neck, abdominal wall, extremities, scalp & face. Where the primary was known, the most common metastasis was from Head & Neck squamous cell carcinoma, followed by thyroid carcinoma, renal cell carcinoma, metastatic adenocarcinoma from the gastrointestinal tract, hepatocellular carcinoma, chondrosarcoma, sebaceous carcinoma, small cell carcinoma lung, multiple myeloma and myeloid sarcoma. In the patients with an unknown primary, the diagnoses was made on cytomorphology aided by CB-ICC and included multiple myeloma, plasmablastic lymphoma, adenocarcinoma and hepatocellular carcinoma.

**Conclusion:** A significant proportion of subcutaneous nodules were malignant (15.7%) and should be kept as a differential diagnosis for subcutaneous nodules. In patients with known primaries they help establish the diagnosis with ease. This is of importance in patients with terminal disease in helping avoid more invasive interventions. FNAC and CB-ICC suggests a potential primary site where it is not known beforehand.

## P18-14 | Case Report Of Epithelial-Myoepithelial Carcinoma Of Trachea

N. Tamazyan; M. Boriskova

*Academician I. P. Pavlov First St. Petersburg State Medical University» of the Ministry of Health of the Russian Federation, St. Petersburg*

Primary epithelial-myoepithelial carcinoma of trachea is a extremely rare tumor. The diagnosis of the tumor is based on histological and immunohistochemical evaluations. We report a case of primary epithelial-myoepithelial carcinoma of trachea in a 45-year-old woman who was referred to our institution for breathing problems. Computed tomography revealed a solid mass in the upper third of trachea. FNA of the mass lesion was performed. Cytopathological report was malignant tumor, NOS. The core-biopsy was made. The histopathological diagnosis using immunohistochemistry was primary myoepithelial carcinoma. We reviewed and reevaluated cytology

slides. Considering the opportunities of rare neoplasms it is possible to make the diagnosis of epithelial-myoepithelial carcinoma using only cytological material.

## P18-15 | Fine-Needle Aspiration Cytology For Melanoma: Review Of 79 Cases

I. De la Peña; Y. Brygadyr; A. M. Rodríguez; P. López-Ferrer; M. Mendiola; A. Peláez-García; B. Vicandi
*Hospital Universitario La Paz, IdiPaz, Madrid, Spain*

**Objetives:** Melanoma represents approximately 1.5% of tumours in both sexes, being more frequent in 40–70 years old patients. Fine-needle aspiration cytology (FNAC) has demonstrated to be highly sensitive and specific for the diagnosis of metastatic melanoma.

Morphologically, melanoma shows multiple features and different patterns. Typically, the aspirates are hypercellular with poorly cohesive cells that have abundant cytoplasm and an eccentric nucleus with evident nucleoli. A characteristic feature only seen in 27.6% of metastatic cases is the presence of an intracytoplasmatic pigment. The diagnosis can be confirmed by immunostaining being positive for S100 protein, SOX10, HMB45 and Melan A. About 40–50% of invasive melanomas have BRAF mutations, which determination allows us to use new targeted therapies.

**Methods:** We review melanoma cases diagnosed in our centre by FNAC from 2013 to 2018.

**Results:** We found 79 cases of melanoma diagnosed by FNAC for 65 patients. Most frequent location of the studied lesions were lymph nodes (30 cases), most of them axillary and inguinal, followed by skin or soft tissues nodes or masses (26 cases), 8 liver space occupying lesions, 5 pulmonary nodes or masses, 5 eye lesions, 3 breast lesions, 1 pancreas nodule,1 peritoneum and 1 in gallbladder wall.

Immunocytochemistry techniques were made for 49 cases (35 HMB45 and Melan A, 8 Melan A, 3 HMB-45, 2 SOX10 and 3 S100 protein) and BRAF mutation determination in 7 cases (3 positive and 4 negative).

**Conclusions:** FNAC is a useful technique for metastatic melanoma diagnosis in patients with previous melanoma diagnosis and also in those ones with not-known primary tumour. The aspirate material enables the use of immunocytochemistry techniques, often needed for a correct diagnosis, and the BRAF mutation determination, that set the use of new targeted therapies.

## P18-16 | Fine Needle Aspiration: Metastatic Hepatoblastoma To The Bone, A Case Report And Literature Review

I. Munné-Bertran; S. Valera; S. Ubalde; R. Benages; C. Iglesias; J. Camacho; S. Ramón y Cajal; C. Dinarès; J. Temprana-Salvador
*Vall Hebron University Hospital, Barcelona, Spain*

**Objectives:** Hepatoblastoma is the most frequent pediatric primary malignancy of the liver, accounting for just over 1% of pediatric cancers. 90% of them affect children younger than 5 years. Its cytological diagnosis is complex due to having multiple subtypes, classified as epithelial, mixed epithelial and mesenchymatic, and an extensive differential diagnosis.

**Methods:** We present the case of a 5 year-old boy with a known and resected hepatoblastoma with pulmonary metastases treated with chemotherapy which regressed. One year later, fine needle aspiration (FNA) of a bony lesion in the right humerus was performed, obtaining 4 Papanicolau stained smears, 3 Diff-Quick stained smears and a formalin fixed, paraffin embedded cell block.

**Results:** Cytology smears show a population of discohesive cells of small size, oval and vesicular nucleus with scant cytoplasm, which are features indicative of a small blue round cell tumor. Immunohistochemistry (IHC) is performed in the cell block material. Tumor cells are diffuse and intensely positive for Beta-catenin (nuclear and cytoplasmatic staining), CKAE1/AE3, vimentin, CD10 and CD99. Glypican-3 and synaptophysin show a patchy expression, and some isolated cells express CK19. CD45, alfa-fetoprotein, Hep Par1, CK7 and WT1 are negative. INI1 nuclear expression is preserved. IHC findings are diagnostic of metastatic hepatoblastoma to the bone.

**Conclusions:** Metastases usually occur within the lung. Other sites of distant metastases, including brain and bone are extremely rare, being almost no reported cases in the literature. The main differential diagnostic must be made with pediatric small blue round cell tumor like neuroblastoma or Wilm's tumor amongst others. Cytomorphologic features of hepatoblastoma in conjunction with IHC and clinicopathological correlation allow FNA to accurately diagnose this entity.

## P18-17 | ISO 15189 Accreditation For The Performance Of Analysis In Cervical Cytology: Processing, Papanicolaou Method, Microscopic Description And Diagnosis In Valdecilla University Hospital

M. Martino; M. A. Revuelta; M. Mayorga; F. Fernández; I. Lastra; C. Martinez; M. L. Cagigal; J. Martín
*Valdecilla University Hospital, Santander, Spain*

**Objectives:** ISO 15189 has become the most important standard for accreditation of medical laboratories. In this study, we

describe our institution's experience in the accreditation of cervical cytology.

**Material and methods:** We included an objective, scope, equipment, materials, reactives, technical process description, revue of this process, diagnosis of the specimens, report configuration in the informatics system, validation and sign of the report, control quality and verification.

**Results:** A technical process description of what we do and how we do it in our laboratory in cervical cytology. There are three internal quality controls interpathologist, intercytotechnians and doble check in negatives samples and one external quality control. We made evaluation reports of all the quality controls and quality indicators every 6 months.

**Conclusions:** With the ISO 15189, we built a quality system in cervical cytology that identifies all aspects in the total testing process from test request to the laboratory through preanalysis and analysis to the report and advice to the requester.

## P18-18 | A Methodology For Impression Cytology Of The Ocular Surface

P. Mendonça; K. Freitas

*Instituto Politécnico de Lisboa, Escola Superior de Tecnologia da saúde de Lisboa, Portugal*

**Objective:** The impression cytology of the ocular surface is a minimally invasive technique that allows the analysis of conjunctival and corneal cells, as an alternative to smears, biopsies and punches.
The aim of this study was to present a technique for collecting, fixing and staining of impression cytology of ocular specimens.

**Methods:** We analyzed 50 samples of bulbar conjunctiva taken from 50 volunteers. The material was collected on a strip of cellulose acetate from Millipore, then fixed and stained with Papanicolaou stain. The slides were analyzed by three independent evaluators, using an evaluation grid with the following parameters: cell size, detail and nuclear membrane, detail and cytoplasmic membrane, ratio N/C and tinctorial affinity. The final score per slide was obtained through the sum of all considered parameters (scale 0 to 41).

**Results:** The filter paper with apex helped to correctly position the paper in the eye and the procedure that was applied allowed an effective collection of cells with 50–70% of the filter surface being filled without the need for topical anesthesia. The SureThin fixative presented quality of cell preservation, besides being more economical. The Papanicolaou staining technique proved to be ideal in the coloring of ocular epithelial cells. This developed methodology presented a maximum score of 41 values in a 74% response.

**Conclusions:** The presented method proved to be very effective in evaluating ocular cell samples, while simultaneously proving to be a very cheap and confortable technique for the patient.

## P18-19 | How Often And Why Are Pathologists Including Diagnostic Comments (DCS) In Fine Needle Aspiration Cytology Reports?

R. Lapadat[1]; A. I. Kilic[1]; A. Truskinovsky[2]; S. E. Pambuccian[1]

*[1]Loyola University Medical Center, Maywood, Illinois, USA; [2]Roswell Park Cancer Institute, Roswell Park, New York, USA*

**Background:** The pathology report is the main communication tool between the pathologists and clinicians and its contents and quality of has been the subject of concerted QA efforts. However, no previous study has focused on diagnostic comments. The aim of this study was to determinate the frequency of DCs and their purpose in pathology reports issued in fine needle aspiration (FNA) cytopathology (CP) compared to all other pathology (AO) reports.

**Design:** We searched our department's electronic database (Sunquest Copath v6) for reports containing DCs issued during a one year period (2016). The frequency of DCs was determined for CP vs. AO reports. Natural language search was used to document the reason(s) for including a comment: microscopic description and differential diagnosis; documentation of special stains/immunostains or ancillary study results, documentation of consensus review, intra and extradepartmental consultation, review of electronic medical records for clinical history and imaging findings, and explanations and references for rare or unusual diagnoses. Two-tailed $\chi^2$ with Yates correction was performed for all comparisons.

**Results:** Comments were included in 8,765/35,937 (24.4%) of all reports. Compared to all other reports, FNA CP reports had more comments (934/2,058 (45.4%) vs. 7,831/33,879 (23.1%), $p < 0.0001$). Comments for additional stains showed similar frequency (11.2% vs. 10.9%, $p = 0.67$), were more frequently made for consultations (9.8% vs. 6%, $p < 0.0001$) and clinical history obtained from EMR (8.8% vs. 3.7%, $p < 0.0001$), but less frequently for microscopic descriptions and differential diagnostic considerations (4% vs 9.6%, $p < 0.0001$) and other ancillary studies (3% vs. 0.9% $p < 0.0001$).

**Conclusion:**

1. DC usage varies widely according to the intended audience of the pathology report: they are more frequent in CP (FNA) reports compared to AO reports.
2. The reasons for providing a DC were service-specific; in CP they were used mostly to document ancillary studies, consultations, and the results of EMR information.

## P18-20 | What Is The Frequency Of Equivocal Or Ambiguous Terminology (EAT) IN Diagnostic Comments (DCS) Of Fine Needle Aspiration (FNA) Cytopathology (CP) Reports?

R. Lapadat[1]; A. I. Kilic[1]; G. A. Barkan[1]; A. Truskinovsky[2]; S. E. Pambuccian[1]

*[1]Loyola University Medical Center, Maywood, Illinois, USA; [2]Roswell Park Cancer Institute, Roswell Park, New York, USA*

**Background:** DCs are frequently used in pathology reports to include additional information useful to clinicians, refine or explain the diagnosis, to document the results of additional tests or consultations and to recommend additional diagnostic testing. DCs are therefore meant to increase the clinicians' comprehension of pathology diagnoses and their confidence in these diagnoses. Recent studies showed that pathology report that includes "hedges" or qualifiers conveying diagnostic (un)certainty may be misunderstood by clinicians. The aim of this study was to determinate the frequency of EAT in the DCs of pathology reports issued in FNA CP compared to all other (AO) reports.

**Design:** We searched our department's electronic database (Sunquest Copath v6) for reports containing DCs issued in 2016. We used a natural language search to identify the frequency of use of EAT with terms like "consistent with", "suggestive of", and "clinical correlation indicated/recommended", and then compared their use in CP vs AO reports. Two-tailed $\chi^2$ with Yates correction was performed for all comparisons.

**Results:** EAT words that could be misinterpreted or are used as hedges that were identified in 6,486/35,937 (18%). Compared to AO reports, CP reports showed more common use of any EAT (31 vs. 17.3%, $p < 0.0001$), "consistent with" (16.3 vs. 5.6%, $p < 0.0001$), "indicative of" (7.1 vs. 1.4%, $p < 0.0001$), and "suspicious of" (0.8 vs. 0.3%, $p < 0.0001$), less frequent use of "not excluded/ruled out" (3.3 vs. 4.9%, $p < 0.001$) and "not identified" (0.1 vs. 0.6%, $p < 0.05$), and similar for "clinical correlation recommended" (1.3 vs. 1.6%, $p = 0.3$).

**Conclusion:** We found that CP reports frequently include EA that may decrease the comprehension of the pathology report, often leading to additional testing and increased health care costs. Further studies are needed to determine the acceptable level of EAT in pathology reports that can allow their monitoring as a QA measure.

## P18-21 | Are Diagnostic Comments (DCS) Included In Fine Needle Aspiration (FNA) Cytopathology (CP) Reports Readable By Our Patients?

A. I. Kilic[1]; R. Lapadat[1]; E. M. Wojcik[1]; A. Truskinovsky[2]; S. E. Pambuccian[1]

*[1]Loyola University Medical Center, Maywood, Illinois, USA; [2]Roswell Park Cancer Institute, Roswell Park, New York, USA*

**Background:** Currently, patients have electronic access to their medical information, including their pathology reports (PRs). Traditionally targeted towards clinicians, PRs are currently also read by patients with variable literacy skills. Therefore, although the use of complex medical jargon in PRs is unavoidable, it is important to strive to insure reasonable readability of PRs. Little is known about the readability of PRs, especially in CP. The aim of this study was to measure the readability of the non-templated free-text DCs section of fine needle aspiration (FNA) cytopathology (CP) PRs, and compare it to that of all PRs.

**Design:** Our department's electronic database (Sunquest Copath v6) was searched for reports containing DCs issued in 2016. Readability, measured through various formulas using sentence length, number of words per sentence, word familiarity, numbers of syllables and characters per word, and other factors was calculated for each DC. Readability scores identify a grade level (GL) needed to comprehend the information: GL4-6 is considered easy to read, 7–9 average and >10 difficult; GL12 (high school graduate) and GL16 (college senior). We calculated the Flesh Kinkaid Grade Level (FKGL), Gunning Fog index (GFX), Coleman Liau index (CLI), ARI (Automated Readability Index), and SMOG (Simple Measure of Gobbledygook) of 20 consecutive DCs from FNA CP and 100 other reports.

**Results:** The number of words ($94 \pm 39$ vs. $112 \pm 77$, $p = 0.3$) and number of sentences ($7 \pm 2.6$ vs. $8 \pm 5.8$, $p = 0.5$) was similar in CP and all reports. FKGL was slightly (NS) lower in CP than all reports ($12 \pm 2$ vs. $13 \pm 2.4$, $p = 0.08$) and all other indices were similar, GFX = $15 \pm 2.8$, CLI = $15 \pm 2.9$, ARI = $12 \pm 2.6$, SMOG = $13 \pm 1.6$.

**Conclusion:**

1. The overall readability of DCs of FNA CP reports was very low (GL > 12), and comparable to that of all PRs.
2. Since patients represent one of the target audiences, pathologists should strive to increase the readability of pathology reports.

## P18-22 | Quality Assurance In The Diagnosis Of Cytological Samples

A. Rocher; A. Angeleri; F. Guerra; S. Melba; L. Palaoro

*Universidad De Bs As, Htal De Clinicas Jose De San Martin*

It is essential to implement a quality management system that allows to achieve consensus in the microscopic observation among operators reducing the subjectivity of the method.

**Objective:** To increase the effectiveness of cytological diagnosis through the application of quality control strategies prior to the issuance of the report. To establish the interobserver Diagnostic Reproducibility evaluated by the Concordance Index% (CI), and the degree of certainty in the definitive diagnosis.

**Materials and methods:** 1,025 cytological samples were analyzed in the cytology laboratory (LC) of the Hospital de Clínicas "José de

San Martín" during the period June/16 to June/17. The results obtained in the cytological diagnosis of 52 samples colored by the Giemsa and Papanicolaou method with pathology suspected of pre-malignant or malignant lesion were included in the study. A double control of all the samples was carried out. The final diagnosis (gold standard) was made by means of the evaluation of the clinical history and the follow-up of the patients, and in a few cases with biopsies. The IC between observers was established: Consensus Index (CCI) and the IC of the cytological diagnosis with the definitive diagnosis: Index of Certainty (ICCe)

**Results:** The ICC between observers was 86% and the ICCe was 90%. The sensitivity (S) in the cytological diagnosis of our laboratory was high, with a value of 90%. Only one false positive value was reported, which reported a specificity (E) of 98%.

**Conclusions:** There is a high diagnostic reproducibility among the members of the cytological laboratory, which shows that the diagnostic criterion is unified. The values of S and E were high, demonstrating high levels of knowledge of the subject and concentration in the observation, fundamental parameters to achieve high certainty in the results.